CRITICAL SUCCESS FACTORS FOR SHOULD COST PLANNING

THESIS

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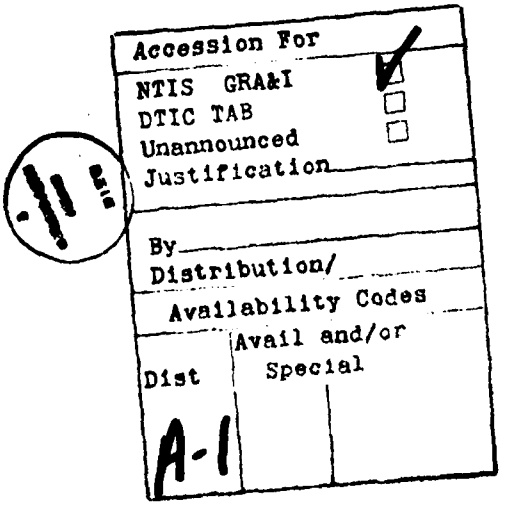

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THESIS

Presented to the Faculty of the School of Systems and Logistics
of the Air Force Institute of Technology
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In Partial Fulfillment of the
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Abstract

Should Cost is a technique of contract pricing that is used to develop a realistic price negotiation objective. The Air Force accomplishes the Should Cost by sending an integrated team of government procurement personnel, contract administrators, auditors, and engineers to the contractor's facility. The objective of the team is to identify uneconomical and inefficient practices of the contractor and to quantify the findings in terms of their impact on cost. Leading procurement analysts at Headquarters Air Force Systems Command and Aeronautical Systems Division identified the lack of proper planning guidance as a major problem facing Air Force Should Cost efforts. Therefore, the research focused on identifying the critical success factors of Should Cost planning. To establish the critical success factors, the researchers designed and distributed a survey that gathered data on former Should Cost team members' perceptions of various aspects of Should Cost planning. Comments were also solicited from the survey respondents through open-ended questions. The returned surveys were analyzed using the FREQUENCIES, T-TEST, and DISCRIMINANT subprograms of the Statistical Package for the Social Sciences. Based on the statistical analyses and the

respondents' comments, the researchers identified twelve critical success factors of Should Cost planning.

CRITICAL SUCCESS FACTORS FOR SHOULD COST PLANNING

I. Introduction

The Military Procurement Cost Problem

In recent years, media attention and criticism have been directed at government procurement policies. Most of the criticism is directed towards the Department of Defense (DOD) because of the size of its budget and its inability to control cost growth and overruns. Press articles claiming improprieties, as well as mismanagement of government programs, pervade the current literature. Reports such as the following are common (19:13):

> . . . (1982) federal projects have chewed at least 318 billion dollars out of taxpayer's wallets--enough to pay nearly a third of the national debt.
>
> Overruns last year (1981 federal projects) averaged 140 percent. . . . Most of the overruns--243 billion dollars worth--occurred in military projects.
>
> The Navy cut its order of Harpoon antiship cruise missiles by 47 percent but still wound up with cost more than double the initial billion-dollar estimate.

The examples are by no means the extent of many that could have been cited as evidence that defense spending, and especially defense overspending, make the news. With federal deficits reaching nearly $200 billion annually, impetus has been placed on bringing defense program costs

under control.

Concern over the productive use of government procurement funds is a major issue within the DOD (2:56). The issue, as well as several others, was identified in 1981 by Deputy Secretary of Defense Frank C. Carlucci. Carlucci chartered working groups from all the services to identify areas needing improvement within the acquisition process. Although acquisition studies had occurred in the past, Carlucci's was much different. The difference was a DOD commitment to demonstrate action not rhetoric and to aggressively employ principles of effective systems management. In Carlucci's view, past problems were caused by too much studying and talking and not enough action. Carlucci's action resulted in 32 acquisition improvement initiatives. It is beyond the scope of the paper to go into all of Carlucci's initiatives and their merits; however, Brabson's article, "Department of Defense Acquisition Improvement Program," contains additional information (2:54).

Of interest to the research is the fact that the inability to estimate cost realistically was identified as one of the eight fundamental management principles of Carlucci's 32 initiatives (2:58). A greater appreciation and understanding of the importance of being able to realistically determine costs can be gained by examining defense procurement trends and federal funds allocations.

Defense procurement trends for the 1980s have emphasized the need to modernize and strengthen both conventional and nuclear forces. Attention has been directed to such areas as theater nuclear weapons, the Navy's shipbuilding program, air and sea mobility, research and development, nuclear modernization, new strategic programs, and additional aircraft (30:5). Table I is an example of Air Force procurement actions that were either proposed or under contract during Fiscal Years 1981, 1982, and 1983 (30:35).

To accomplish what has been identified as the defense objectives for the 1980s, the total obligational authority for Fiscal Years 1981-1983 was increased in real terms by $65.7 billion or 36 percent since 1980 (31:1). Total obligational authority is the number of dollars obligated to a program. Disregarding inflation adjustments, procurement appropriations grew by 131.9 percent, and operations and maintenance funds grew by 43.4 percent for the same period (31:9). In 1983, $240.5 billion were appropriated for defense. Of that total, $80.3 billion were allocated for procurement and $66.8 billion for operations and maintenance. The balance was allocated to personnel and research and development (31:7).

The purpose of increased defense funding is to raise our military capability to a level sufficient to meet national objectives. However, there is concern within the

TABLE I

Air Force Major Systems Acquired
(W:35)

Category	Totals Proposed FY81	FY82	FY83	Actually Acquired FY81-FY83
Aircraft:				
A-10	60	20	20	100
B-1B	--	1	7	8
F-15	42	36	39	117
F-16	180	120	120	420
A-7K	6	--	--	6
KC-10A	6	6	8	20
C-5	--	--	2	2
TR-1	5	5	4	13
E-3A	2	2	2	6
UH-60	6	6	--	11
F-5F	--	3	3	6
ACTUAL TOTALS	305*	199	205	709
Missiles:				
ALCM	480	440	330	1250
MX	--	--	--	--
GLCM	11	54	120	185
HARM	--	136	120	256
IR Maverick	--	490	2560	3050
Sidewinder	1280	1800	1920	5000
Sparrow	1050	1050	1300	3375
ACTUAL TOTALS	2821	3945	6350	13116

*Note: The figures may not total correctly since all proposed acquisitions were not necessarily acquired (ie. UH-60 12 proposed; 11 acquired).

DOD that increased defense spending may not be yielding a commensurate increase in capability (31:5). Desired capabilities are not being realized in part because large amounts of the money budgeted goes to cover cost overruns or cost above originally contracted estimates. The most desirable situation for the DOD is to maintain cost within the budget. Otherwise, the DOD must obtain significantly more dollars to meet its needs. If additional funds cannot be obtained, then there must be a reduction in either the number of systems purchased or in some aspect of the system's capabilities (31:5-6). To avoid systems degradation in either numbers or capabilities, the DOD seeks to identify and control the factors causing cost escalation.

A number of factors have been identified which contribute to a program's cost growth. Contributors to cost growth include the following (30:36):

1. Poor inflation estimates.
2. Poor cost estimates.
3. Program stretch-out.
4. Changes in specifications.
5. High-risk system design.
6. Lack of competition.
7. Declining defense industrial base.

Table II shows the importance of cost and scheduling growth factors determined by an Air Force analysis of acquisition cost (30:36).

TABLE II

Cost and Schedule Growth Factors (W:36)

	FREQUENCY of OCCURRENCE	%
Funding Instability	----------	56
Technical Complexity	----------	56
Technical Advance	----------	56
External Mgt. Impact	----------	55
Technical Problems	----------	53
Non-Concurrency	----------	47
Requirements Change	----------	46
Engineering Instability	----------	43
Unrealistic Cost Estimate	----------	41
Multiple Interfaces	----------	38
Lack of High Level Support	----------	37
Test Requirements	--------	23
Utilities	-----	19
Short Acq Cycle Impact	---	12

One method commonly proposed by the DOD to reduce systems acquisition cost involves the use of competition. DOD Directive 5000.1 states that "competition will be employed to the maximum extent practicable to ensure that defense systems are cost-effective and are responsive to mission needs" (29:2).

Although the directive is Government policy, testimony before the House Budget Committee revealed a trend toward less competition, and less price competition, in the DOD's negotiated awards. From 1971 to 1978, competitively negotiated contracts fell from 31 to 29 percent of all contracts awarded. Also, during the same period, noncompetitive (sole-source) contract awards rose from 58 to 64 percent of all contracts awarded and remained at that level in Fiscal Year 1979 (30:53). As a result of the lessening of competition within the defense marketplace, the Government must insure that the "contract price negotiated represents what the contractor should incur in performance of the contract, assuming reasonable efficiency" (1:42).

Should Cost Introduced

The Government has and uses a costing technique that specifically addresses active cost control in noncompetitive situations. The technique, known as "Should Cost," is especially useful for, but not limited to noncompetitive sole-source type contracts. The purpose of a Should Cost is

to evaluate a contractor's proposal. The Air Force accomplishes the evaluation by sending an integrated team of government procurement people, contract administrators, auditors, and engineers to the contractor's facility. The team of experts looks for uneconomical and inefficient operation by the contractor. Inefficient operations are documented and alternative operating methods are determined. The team quantifies its findings in terms of cost and sets realistic price objectives to be used by the government negotiator (18:122).

The intent of the Government is not to tell contractors how to run their business even though inefficiencies may be determined through Should Cost efforts. Instead, the Government presents the findings to the contractor, and makes it clear that taxpayers' money will not be paid out for demonstrated inefficiencies (3:41).

Importance of Should Cost

Should Cost is highly regarded because it addresses the two current philosophical presumptions currently existing within contract negotiations:

1. The traditional approach is ineffective (12:49).
2. Contractors are generally inefficient (1:42).

Traditional Approach. The traditional approach uses historical cost as the baseline for contract negotiations. Traditional negotiation practices for arriving at a

settlement include the following (20:7):

1. Contractor's proposal submission.
2. Audit and technical fact finding of the contractor's proposal costs.
3. Comparison of the findings to the actual historical base upon which the contractor justified the proposal.
4. Contract negotiation.

The traditional approach is used to determine the baseline for most defense contracts. However, the approach has been less than effective as a cost estimation technique because inefficiencies and poor standards of the past are simply carried into future programs (8:333). Thus, the historical baseline becomes a misleading indicator of the present period. The belief is espoused throughout the literature consulted. The following statement by Robert Puff summarizes the general view (20:15):

> By using the contractor's prior cost history and estimation rationale as the basis for negotiations, the government implicitly accepts the contractor's mode of operation, regardless of how efficient or inefficient it might be. Often the resultant price is the will cost . . . and inefficiencies in the historical base are perpetuated.

Inefficient Contractors. The second presumption states that defense contractors are generally inefficient. As a result, their contract proposals would be overstated (1:42). Should Cost studies attempt to identify inefficiencies, and thus lower acquisition costs (1:42). Once the inefficiencies are identified, cost estimates based on

current production efficiencies can be used to establish a clear and reasonable baseline (22:22). The results ought to be lower acquisition cost (1:42).

Problem Statement

Justification. Recently, the Honorable Verne Orr, Secretary of the Air Force, stated that Should Cost is "one of the most promising ways we have to assure reasonable prices in our large programs" (18:122). In addition, the Comptroller General of the United States stated that the proper application of Should Cost concepts would have great potential benefit for the Government (23:2). Procurement analysts at Headquarters Air Force Systems Command (7) and price analysts at Aeronautical Systems Division (9) agree, but feel that a major problem facing Air Force Should Cost is the lack of proper planning guidance. Since planning forms the foundation for the entire effort, its importance cannot be overstated. According to AFP 70-5, "effective planning is critical to the success of a Should Cost analysis" (25:3-2).

Effective planning serves the following three important purposes (25:3-1):

1. It insures that the procuring agency and the team do, in fact, consider the task at hand, how it is to be accomplished, what resources will be required, and what schedules must be met.

2. It provides an operating guide and checklist for use by the procuring agency, the team's managers, and the individual team members in performing

their specific roles and insuring that significant tasks are not overlooked.

3. It serves as a control device against which progress may be measured and problems identified for corrective action.

Problem Statement. No previous studies have examined Should Cost planning to determine exactly what are the critical success factors that lead to effective planning.

Research Objectives

Accomplishment of the following objectives will help to identify critical success factors in Should Cost planning as perceived by former Should Cost team members.

Objective One. Identify significant differences between Should Cost supervisors' and nonsupervisors' perceptions of Should Cost planning.

Objective Two. Identify significant differences between the perceptions of Should Cost team members classifying planning as "effective" and those classifying planning as "ineffective."

Objective Three. Identify a rank ordering of key discriminants of effective/ineffective Should Cost planning as determined by perceptions of Should Cost participants.

Objective Four. Evaluate Team Chief and Deputy Team Chief perceptions of Should Cost management authority and guidance.

Objective Five. Evaluate sources of information Should Cost team members stated were the most helpful in the Should

Cost planning process.

Objective Six. Evaluate areas of Should Cost planning that team members stated as needing improvement.

Limitations of Research

The following list of factors limited the degree to which the results of the study can be generalized.

1. The research effort looked at Should Cost planning in only four Air Force procurement programs. Therefore, the results do not include the total population.

2. Many of the assumptions proported by the researchers are based on relationships established by statistical tests. Any generalizations about the whole population are limited by the incompleteness of the sample population.

3. Prior to the research, no validated questionnaire existed that could be used to elicit former Should Cost team members' perceptions of planning.

Organization of the Research

Chapter one of the thesis contains introductory information, the problem statement, and research objectives used to gain information toward the possible solution. Chapter two contains information concerning the history of Should Cost; a definition and overview of the Should Cost process; and empirical findings from previous Should Cost studies. The third chapter deals with the research methodology. The chapter discusses the development of a survey instrument to measure perceptions of Should Cost planning, and the statistical tests used to analyze the

data. Chapter four contains the major results of the analyses. The fifth, and final chapter, contains the conclusions and recommendations of the research.

II. Should Cost

Historical Perspective

Should Cost originated within the civilian sector. A large, nation-wide consumer goods chain had been using a technique much like Should Cost to evaluate its suppliers for years (3:1-5). The company's market position was strong enough for it to require supplier participation in Should Cost studies. The technique resulted in lower prices because it encouraged suppliers to search for more efficient ways to manufacture products.

In 1967, the DOD became concerned about the escalating price of the Pratt and Whitney TF-30 jet engine being manufactured for the F-111B aircraft (28:1-5,6). As a result, a DOD team, under the guidance of the Chief of Naval Procurement, undertook to apply the civilian sector Should Cost method to a Government procurement. The first Government Should Cost study was conducted over a three month period, employing some 40 specialists and costing approximately $300,000 (33:5). The analysis resulted in an estimated savings of over $100 million. According to DARCOM Pamphlet 715-7 (28:1-6):

> These Should Cost results were significant and demonstrated the usefulness of the technique both for lowering contract costs and improving contractor operations.

Although the Navy was the pioneer in Government Should

Cost, it has not conducted many Should Cost programs through the years. The Navy's point of view toward Should Cost stated in 1971 by Rear Admiral Rowland G. Freeman III, former Deputy Chief of Naval Materiel, is still true today (11:26):

> . . . our position in the Navy is that 'should cost' is just one method of pricing which is available to the contracting officer and it is applicable only when we have reason to believe that a predominantly sole source contractor is not meeting the test of reasonable economy and efficiency.

The Air Force conducted its first Should Cost effort in 1967 when it reviewed the cost of the Minuteman Missile (20:2). From 1967 until 1979, the Air Force reported savings of $565 million in contract costs through Should Cost studies, while the costs of conducting the studies amounted to only $1.4 million (12:56).

In the early 1970's, the Army deemed Should Cost a valuable tool and implemented a program to "aggressively pursue and expand its use for major procurements" (27:1-6). From 1971-1973, the Army employed the Should Cost analysis technique on 18 major procurements (24:vii). Through the years, the Army has continued to support the Should Cost approach "with the realization that the SC (Should Cost) approach does produce significant economies" (28:1-2).

Despite the large savings reported, the services have not used Should Cost all that frequently. A 1979 survey disclosed that between 1973 and 1979, the Army conducted 89

Should Cost studies, the Air Force 37, and the Navy only 3 (12:50). However, Carlucci's emphasis on realistic cost estimating has created a renewed interest in Should Cost. The renewed interest is apparent in both the Army and the Air Force. The Army proposed 55 analyses during 1983 and expects to have at least that many proposals in 1984 (5). The Air Force has also stepped up its efforts for 1984 with the identification of 11 programs for Should Cost analysis (7).

Definition

Should Cost is officially defined in AFP 70-5. The definition follows (25:1-1):

> Should Cost: A technique of contract pricing that employs an integrated team of Government acquisition, contract administration, audit, and engineering representatives to conduct a coordinated, indepth cost analysis at the contractor's or subcontractor's plants. The objective is to identify uneconomical or inefficient practices in the contractor's management and operations and to quantify the findings in terms of their impact on cost. The result is the development of a realistic price objective that reflects reasonably achievable economies and efficiencies.

Two characteristics distinguish Should Cost from other costing techniques. The first is the use of special teams of highly qualified individuals to perform a vigorous indepth analysis of a contractor's operations. The second, although not specifically addressed in the definition, is the use of team findings to challenge not only cost but

inefficiencies in contractor operations (33:20).

Concepts

A team consisting of price analysts, cost analysts, industrial engineers, auditors, and technical specialists conduct a thorough review of contractor procedures. Inefficiencies in the contractor's cost proposal and supporting data are identified through a coordinated analysis of the contractor's manufacturing and management operations. The analysis, which occurs at the contractor's facility, examines such areas as auditing, pricing, engineering, and business management. Through the review, the team attempts to arrive at an estimate of what the system should cost assuming reasonable efficiencies in operation (28:1-1).

Objectives

In essence, the Government has a short-term and a long-term objective in its use of the Should Cost concept. The short term objective is to place the Government in a more supportable contractual bargaining position (20:1). A strong knowledge of contractor operations will allow the government negotiator to challenge a contractor's cost estimates with authority (8:472). In this way, the Government will be able to realize immediate cost savings by negotiating the contract at a fair and reasonable price (20:1). In addition to cost reductions, a better definition

and understanding of current contractor manufacturing procedures is obtained (3:39).

The other, more subtle objective of Should Cost lies in its potential future benefits. By identifying contractor inefficiencies, the Government hopes to realize long-term benefits of increased contractor efficiency for any follow-on procurements (20:1).

Who Gets Should Costed

Should Cost is not adaptable to nor desirable for all contracts. According to AFP 70-5, the Should Cost technique "should be applied in those selective instances when the Air Force can anticipate major payoffs" (25:2-1). According to Air Force guidelines, Should Cost reviews are most productive when used under the following conditions (25:2-1):

1. Sole source contracts.
2. The present and potential value of work is great.
3. The contract calls for future year productions.
4. Specifications are definite and unchanging.

In the Air Force, Major Commands determine the most likely candidates for analysis. Factors bearing on the decision other than those listed above include potential return on time and manpower resources invested. The nature of a Should Cost analysis will require that the personnel involved spend many weeks planning the analyses, conducting

the evaluation at the contractor's plant, and studying the results. Because of the large commitment of time and manpower, the Major Command must perform a cost-benefit analysis to determine if a Should Cost is warranted. They must determine whether the Should Cost can indeed provide negotiation benefits that will justify the cost of the resources expended (25:2-2). If potential benefits outweigh the costs involved, a decision will be made to conduct the Should Cost effort.

Should Cost Phases

Both the Air Force (25) and Army (28,26) regulations break down a Should Cost analysis into four phases:

1. Planning.
2. On-site data acquisition.
3. Analysis and reporting.
4. Negotiation.

A cursory overview will be provided to familiarize the reader with each phase.

Planning. The first area to be examined is the planning phase. The planning effort is broken down into five levels (25:3-1):

1. Buying agency plan.
2. Advance team plan.
3. Overall team plan.
4. Subteam plans.

5. Individual members plans.

The buying agency plan begins with the selection of the Team Chief. Team Chiefs are given a charter which establishes their authority and responsibility during the analysis. The charter also clearly defines the Should Cost task to be performed and sets time constraints (25:3-1). Lastly, the contractor is notified of the impending visit (25:3-10).

The advance team plan includes selection of the subteam chiefs and other key team members. The individuals comprise the advance team which is selected prior to the formation of the entire team. The advance team reviews Government information and contractor proposals to determine specific areas requiring detailed analysis and the necessary manpower requirements for the major Should Cost effort (25:3-10). They become familiar with plant operations and determine the data available or required for the full team visit (25:4-5). Information not readily available should be requested from the contractor to ensure availability before the full team arrives. The advance team must ensure that the contractor is briefed on the goals of the Should Cost and has a clear understanding of the support that will be required (3:41).

The third phase of planning, development of the overall team plan, is accomplished using the information and specific requirements obtained from the advance team visit. The overall team plan should include such items as a master

schedule, a dependency network giving relationships of various parts of the overall analysis, and consolidated planning sheets prepared by each of the subteams. Team composition is determined prior to the completion of the phase (25:3-10).

The final two planning levels, subteam and individual plans, differ from overall team planning in the degree of detailed planning involved. During phases four and five detailed planning is conducted to identify the functional analysis that will be carried out by the subteams and the individual members. The purpose of the planning levels is to specifically define the analysis efforts of the subteams and the functional responsibilities of the individuals prior to the on-site visit (25:3-11).

All of the phases must be thoroughly coordinated to insure a successful Should Cost program. Previous experiences have identified a definite correlation between developing a sound operational plan and having a smooth running and productive Should Cost analysis (25:3-2).

Data Acquisition. The data acquisition phase, which is the on-site investigation, normally involves one to four months of time. Every aspect of the contractor's operation should be examined, but at a minimum the following areas should be considered (32:25):

1. Labor standards and direct labor controls.
2. Production processes and controls.

3. Plant layout.

4. Material controls.

5. Procurement practices.

6. Make-or-buy policies.

7. Accounting and cost estimating systems.

8. Indirect expense controls and allocations.

9. Quality control procedures.

Analysis and Report Generation. Analysis is an integral part of report generation. It involves interpretation and integration of the data accumulated (3:41). Once the data are analyzed, they must be organized for report generation. Reports are the final product and realization of the team's efforts. The documents created from the findings must be accurate and detailed because they become the basis for the Government negotiator's bargaining position. All identified and challenged contractor inefficiencies must be defendable (3:41).

Negotiation. With the report in hand, negotiations begin. The government negotiator is particularly interested in any areas identified as inefficient. Some of the areas commonly identified include plant layout, inspection and sampling techniques, material purchasing, and inventory control (3:41).

Empirical Findings from Previous Studies

Since its inception, Government Should Cost procedures

have been analyzed considering the following three basic issues:

1. Cost/benefit analysis of Should Cost studies.
2. Methods for conducting Should Cost studies.
3. Team selection procedures.

Applicability of the three basic research issues to the current research is somewhat limited. However, the researchers evaluated the existing literature to ascertain 1) relevant contributions to questionnaire development and 2) support for the research objectives.

Cost/Benefit Studies. Several empirical studies have investigated the cost savings attributable to Should Cost analyses. Most of the cost/benefit studies tried to determine if the savings realized were valid and if they outweighed the resources expended. Results of the various studies have been mixed.

In 1975, Schaefer and Birkhead (21) conducted a research study to quantify the comparisons between cost outcomes on Should Cost negotiated contracts with contractsnegotiated using conventional costing techniques. They analyzed twenty-three Should Cost studies conducted by the Air Force's Aeronautical Systems Division. Statistical analyses indicated that Should Cost "may be producing results less than those originally anticipated " (21:62). A corollary finding indicated that Should Cost may give rise to a greater or continued use of contract changes. The

researchers provided no reason for the increased number of contract changes. However, the researchers' data indicated that even though the original Should Cost showed a significant initial savings, the long term effects were a "potential 'windfall' profit situation" for the contractor (21:61-62). To discourage the use of contract changes as a potential strategy by firms, Schaefer and Birkhead recommended the Government 1) closely evaluate the need for the change and 2) consider the use of a no fee or profit policy below a certain dollar threshold for contract changes (21:62).

In 1978, Weis (34) conducted a cost analysis of Army Should Cost programs accomplished during Fiscal Years 1973 through 1977. The study indicated a positive and direct correlation between Should Cost savings and initial contractor proposal estimates (34:13). Weis analyzed thirty Should Cost programs and presented data on the proposal costs, the negotiated amount, total savings due to the Should Cost analysis, and the cost of conducting the analysis. The savings attributable to Should Cost from the thirty programs totalled $146.1 million (34:15). Only one of the Should Cost studies failed to show a savings. Weis recommended that total cost of the proposed procurement be the determinate factor for consideration of future Should Cost candidates (34:13).

In 1983, Conway and Howenstein (4) conducted a study

similar to the Schaefer/Birkhead study. Their objective was to determine if a significant difference existed between Should Cost and conventional cost analyses within the Army and Air Force (4:52). The researchers' primary findings indicated the following (4:52-53):

1. Air Force Should Cost efforts are apparently not achieving significant reductions in acquisition costs.

2. Army application of Should Cost is yielding positive results that are of a higher percentage reduction than the Air Force.

A corollary finding identified a lack of available information regarding Should Cost studies. To alleviate the problem, the researchers recommended the establishment of a central data bank for Should Cost information.

Applicability. The current research does not address the question of cost versus benefit for a Should Cost study. However, the research does consider changes, contractor response to changes, the degree to which Should Cost participants understand contractor operations, and lack of available information. Responses to the identified areas could potentially be used to improve Should Cost performance during the planning stage.

Methods for Conducting Should Cost Studies. In 1972, Weida and Sloan conducted an empirical analysis to determine the desirability of establishing an on-going capability for Should Cost in the Air Force (33:124). The researchers recommended that a permanent organization be established in

the Air Force Contract Management Division to monitor all aspects of Air Force Should Cost. They also recommended the establishment of a Should Cost training and research center (33:127). According to the researchers, the center should perform functions such as the following (33:127-128):

1. Provide information to the research effort concerning the use and expansion of Should Cost.
2. Maintain a library of reference material for use by Should Cost teams.
3. Provide consultant services to Should Cost teams.
4. Provide a training course which draws on previous Should Cost efforts.

Weida and Sloan also found that a need existed for conceptual and "lessons learned" information from previous Should Cost studies (33:127). They recommended that published material and information relative to existing Air Force Should Cost studies be made available to all organizations within the Air Force weapons acquisition process. They contended the following (33:127):

> Many cost management problems tend to be of a recurring nature even though contractual environments may differ. Although each team works under somewhat different conditions, many of the basic problem areas will most likely be encountered by all. There is a need, therefore, for ready access to the distilled experiences of previous teams.

Currently, the Air Force has Should Cost representation within Systems Command and at Headquarters levels. However, the organizations do not provide many of the functions advocated by Weida and Sloan. There appears to be no

discernable formal structure in the Air Force's Should Cost program. There is an absence of existing information from previous Should Cost studies (4:57-58). Research, in general, supports the conclusion that the Air Force should provide more structure and guidance in the implementation of Should Cost efforts.

Applicability. The Weida and Sloan research dealt primarily with the Air Force's ability to conduct effective Should Costs. Their findings were considered in the current research. Specific analysis deals with the use of information sources and the value of consultant services. Based on Weida and Sloan's recommendations as well as interview findings, the researchers sought out and were able to obtain "lessons learned" from the *Maverick*, GPU-5/A, and GBU-15 Should Cost studies. The programs were three of the four evaluated by the current research effort. The researchers evaluated the "lessons learned" documents for specific comments regarding the planning aspects of Should Cost. The following areas were considered important: 1) knowledge of the contractor; 2) coordination and lines of communication; 3) team composition; and 4) experience and knowledge of the team members. The "lessons learned" provided assistance in the formulation of the questionnare and will be discussed in Chapter Three.

Team Selection Procedures. The final area of Should Cost research efforts deals primarily with team selection

and analysis. In 1971, Lange (14) investigated four different approaches to determine how to best handle the problems associated with team size and composition. The four approaches included the following:

1. Mini-team concept.
2. Flexible team sizes.
3. Team size based on procurement dollar value.
4. Advance team concept.

A brief explanation of the four approaches is provided for reader familiarization. The mini-team approach consists of approximately seven team members. The professional mix of team members is tailored to the specific Should Cost task. According to Lange, the mini-team would be economical in terms of manpower, but it could only be effectively used to analyze one or a few elements of a contractor's operations (14:34). Therefore, the mini-team aproach would not be effective in conducting the indepth analysis required of a Should Cost.

The flexible team size approach adjusts team size and mix according to the requirements of the Should Cost study (14:34). The approach is effective for shortening of work assignments (14:34-35). Discrete tasks are structured for individual team members for the duration of the task. Once the tasks are succesfully completed, the team members are released. Lange stated that the approach would be effective if urgency prevented adequate pre-planning efforts (14:34).

Team size based on procurement dollar value requires very little planning and preparatory effort (14:28). However, the approach is not very realistic since it does not address the complexity factor. According to Lange, complexity is far more significant in determining the strength of a team than the procurement dollars involved (14:35).

Under the advance team concept, an advanced team made up of the Team Chief and subteam chiefs makes an advanced visit to the contractor's plant. Prior to the plant visit by the entire team, the advance team findings and recommendations are collated. From the findings, manpower resource requirements are established for the full team effort. The full-sized team then proceeds to the plant and performs an indepth Should Cost analysis.

Based on the advantages and disadvantages of each method, Lange concluded that the advanced team concept was the most effective approach for determining the necessary team size and composition (14:iv). The advance team approach has subsequently been adopted by both the Army and Air Force and is the current approach used for Should Cost studies.

In 1973, Ulrich reviewed personnel selection techniques commonly employed in business, and proposed to identify characteristics normally considered in personnel selection

(24:vi). To determine if the characteristics of an effective Should Cost team member could be isolated, he attempted to relate biographical data of individuals who had served on Should Cost teams to their performance. Ulrich felt his findings had merit and could be used to some extent to select team members. Guidelines and recommendations from Ulrich's report included the following (24:89-90):

1. An advanced team would be a valuable tool for determining the team size.
2. Selection of team members would be more meaningful if based on his findings of team member qualifications.

Ulrich formulated six major qualification categories for Should Cost team members. The qualification categories consisted of demonstrated job performance, experience, education, ability to communicate, good writing ability, and physical fitness. The qualifications were classified into skills that were "must," "highly desirable," and "optional" for the various specialties normally found on a Should Cost team (24:92).

In 1974, Puff investigated team manning. He concluded that the Should Cost team should be adequately staffed by highly trained and motivated personnel made up of the Team Chief, team members, and on-call support personnel (20:28). To ensure an effective Should Cost study, Puff concluded that a sufficiently detailed plan for the implementation of the efforts should include an appropriate methodology. The

methodology would include a sequence of events which would occur in a typical Should Cost effort.

In 1975, Hoehl conducted a study within the DOD to ascertain attitudes of former team members toward Should Cost (13:9). Hoehl's primary objective was to determine the educational requirements to prepare future Should Cost team members to function effectively in their assigned tasks (13:6). Former Should Cost team members from the Air Force, Army, Defense Contract Audit Agency, and the Defense Contract Administration Service were questioned. For analysis purposes, Hoehl divided his respondents into team leaders and team workers. One specific objective was to identify associations as well as any siginificant differences in the responses to questions in the key element areas of planning, data collection and evaluation, report writing, and negotiations. Hoehl's findings indicated a high correlation between team leaders and workers in their responses to questions dealing with "planning" and "data collection and evaluation." Hoehl's findings also revealed that team members felt a formal educational program should be established to train Should Cost team members as a team whenever possible (13:184-186). The educational program should remove or modify some of the less desirable aspects of Should Cost duty and thus enhance the effectiveness of future teams (13:184-185).

Applicability. Previous research suggested several

areas for consideration in the analysis of planning. The areas included team size, advance team, proper selection of team members, and qualification of team members. The current research attempted to determine the team members' perceptions regarding the quality of people selected and the ability of team leaders to get qualified people. The current research also focused on the correlations Hoehl uncovered with respect to team leaders and workers by testing their responses to Should Cost planning.

Summary

The purpose of Chapter Two was to gain an understanding and appreciation for Should Cost analyses. The chapter discussed the history of Should Cost, the definition and operation of a Should Cost study, and previous Should Cost research. The chapter built the foundation upon which the researchers were able to associate and apply the hypotheses and findings of previous Should Cost studies and "lessons learned" to the current research methodology.

III. Research Methodology

Scope

The research effort will identify the key variables of Should Cost planning as perceived by previous Should Cost participants. To accomplish the purpose, a survey instrument was administered to personnel who participated in recent Air Force Should Cost studies. The survey measured Should Cost team members' perceptions of effectiveness during the planning phase of Should Cost. The survey contained questions that allowed the respondents to express either a favorable or an unfavorable attitude toward Should Cost planning. The statistical analyses performed on the data employed the Statistical Package for the Social Sciences (SPSS) program package. SPSS programs used to analyze data included the FREQUENCIES, T-TEST, and DISCRIMINANT subprograms. The statistical analyses determined significant differences of respondents' perceptions to the effectiveness of Should Cost. In addition, open-ended questions provided respondents the opportunity for specific comment. The open-ended questions served two purposes: 1) to support the statistical analysis and 2) to solicit opinions not included in the survey.

Research Instrument

Justification. The survey approach was selected as the

tool for investigation because of its versatility. The survey allowed both economy of time and cost, as well as a practical way of ascertaining specific information from the respondents. From the various survey methods available, the researchers chose the questionnaire method for the following reasons:

1. A desire to survey as large a population as possible to avoid having to generalize about a certain segment of the population.
2. The size of the population of interest did not not allow personal interview.
3. The respondents were located at various locations throughout the U.S.
4. The cost of a questionnaire was relatively inexpensive.
5. The time available to conduct an investigation was limited.

Development of Questionnaire. Several inputs aided in the development of the questionnaire. Since the purpose of the research was to ascertain team members' perceptions of Should Cost planning, AFP 70-5, Chapter 3, "Planning," provided the basis for many of the survey questions. In addition, Should Cost literature and official documents, including "lessons learned" from previous Should Cost studies, furnished several inputs to the questionnaire. Finally, information received during telephone and personal interviews with key Should Cost personnel at Headquarters Air Force, Headquarters Air Force Systems Command (AFSC), and several product divisions within AFSC contributed to the

questionnaire.

AFP 70-5. According to previous Should Cost team members interviewed by the researchers, AFP 70-5, Chapter 3, "Planning," provided a brief but sound guide for Should Cost planning (7,9). As a result, AFP 70-5 provided the basis for the following questions:

> Questions 4-7, 9, 12, 13, 15, 17, 22, 23, 25-28, 30, 34-36, 38-46

Question 4 is representative of the questions formulated from AFP 70-5.

> 4. I had adequate knowledge of the contractor's proposal in drawing up my plans.

The basis for the question was paragraph 3-3c:

> The advance team plan must include . . . reviewing the proposal, previous proposals, and information received both from other Government agencies and from the contractor.

"Lessons Learned." Several questions included in the survey came from "lessons learned" documents obtained from the Maverick, GPU-5/A, and GBU-15 Should Cost studies. The researchers incorporated "lessons learned" comments into the survey to see if similiar views were held by other Should Cost team members. The following survey questions were taken from "lessons learned":

> Questions 10, 11, 14, 16, 19-21, 24, 29, 32, 33, 45, 47

Question 21 is representative of question formulated from previous Should Cost "lessons learned."

> 21. The Team Chief should be a colonel/GS-15

or higher.

"Lessons learned" from the GPU-5/A Should Cost provided the basis for the question.

> The Should Cost Team Chief selection should strictly adhere to paragraph 4-3a, AFP 70-5, which specifies that the grade of the Team Chief should be a full colonel/GS-15 or higher.

Personal Interviews and Comments. Three questions resulted from interviews conducted with former Should Cost participants and from comments made on field tested surveys. The questions were not specifically addressed in AFP 70-5 or in "lessons learned" but were highlighted by previous Should Cost team members. The following questions were added based on feedback from interviews and initial surveys:

> Questions 8, 18, 37

Question 18 is representative of questions formulated based on interviews and comments.

> 18. A good relationship existed between the government and the contractor.

A comment made on a field tested survey stated that the instrument did not ask any questions concerning relations between the Government and the contractor. Specifically, the respondent made the following comment:

> (the survey) needs some emphasis on relations/planning between (the) government and contractor as a breakdown here will undermine the best laid government team strategies.

Questionnaire Structure. The final questionnaire consisted of three demographic questions, forty-four

planning questions with responses ordered on a Likert scale, and two open-ended questions. Demographic questions provided data on the position, selection, and status (military, civilian) of the respondents while a member of the Should Cost team. Likert scale questions solicited the respondents' perceptions of their experience with Should Cost planning. Finally, the open-ended questions provided respondents the opportunity to comment on specific areas that did not lend themselves to a Likert scale response.

The scale used for the Likert responses was based on a seven point rating scale ranging from "Strongly Agree" to "Strongly Disagree." A sample of the scale follows:

1	2	3	4	5	6	7
Strongly Agree			Neutral			Strongly Disagree

The seven point scale provided an opportunity for greater sensitivity of measurement. The characteristic was an important consideration for statistical analysis. In addition, leniency, central tendency, and halo effect were considered and adjusted for in the questionnaire by varying the strength of descriptive adjectives and by stating some questions in inverse form (6:263-264).

Reliability and Validity. In order to ensure the appropriate design of the survey instrument, the questionnaire was exposed to field tests. Initially, a

small group of key Should Cost team members reviewed the survey instrument. The individuals did not specifically answer the survey questions, but commented on the content and validity of the instrument. From their inputs, the questionnaire was revised. Next, a different group of team members acted as a field test group for the revised questionnaire. The second test group answered each survey question and additional questions that addressed survey length, readability, validity, and any suggested improvements. Analysis of the responses and comments of the second group resulted in the final survey instrument.

Population of Interest

To assure survey responses represented current perceptions of Should Cost team members in the Air Force, two major Air Force product divisions received the questionnaires: Aeronautical Systems Division (ASD), Wright-Patterson AFB, Ohio; and Armaments Division (AD), Eglin AFB, Florida. The two product divisions were selected specifically because they had recently completed Air Force Should Cost studies.

Within the two product divisions, a total of four Should Cost programs comprised the population of interest. Two studies from ASD, the F-100 engine and the Maverick Missile, were selected for survey. From AD, the two most recent Should Cost efforts, the GPU-5/A and the GBU-15, were

selected.

Since the intent of the research was to provide as near as possible a complete and thorough picture of current Air Force Should Cost planning perceptions, complete manning rosters were obtained from the four Should Cost studies. A total of 136 surveys were mailed to participants of the following four programs:

1. F-100 Engine 52 surveys.
2. Maverick Missile 31 surveys.
3. GPU-5/A 26 surveys.
4. GBU-15 27 surveys.

Data Collection Plan

Because of time limitations, the product divisions sponsored the questionnaires within their organization. Each Should Cost team member received a package consisting of a questionnaire and return envelope. A time limit of four weeks for return of the questionnaires ensured sufficient time to code and analyze the data.

Data Classification

Classification of research data into one of four levels of measurement was necessary in order to select the appropriate statistical test. The four categorical levels of measurement are nominal, ordinal, interval, and ratio. In order to use the parametric t-test and Discriminant Analysis, data must be of the interval level. Interval

level means that data may be rank ordered and that the magnitude between the orderings can be determined (17:5).

Partially ordered levels called ordered metric levels have been identified as a level between ordinal and interval. Nie states that (17:6):

> ordered metric consists of ordered categories where the relative ordering of the intercategory distances is known even though their absolute magnitude cannot be measured.

Likert scale data is an example of ordered metric. Abelson and Tukey propose that (17:6):

> the proper assignment of numerical values to the categories of an ordered metric scale will allow it to be treated as though it were measured at the interval level.

Also of interest is a special case of data classification called dichotomy (17:5). A dichotomy is a variable with only two possible categories such as effective or ineffective. A dichotomy satisfies all requirements of interval level measurement (17:5).

Ordered metric data and dichotomy are both employed in the research effort. Survey question responses are in the form of Likert scale or ordered metric data. Dichotomies are employed in the study for the t-test analyses.

Statistical Analysis

Statistical analysis consisted of the following three SPSS programs:

1. FREQUENCIES.

2. T-TEST.

3. DISCRIMINANT.

FREQUENCIES. FREQUENCIES is the first statistical analysis employed. FREQUENCIES provides a number of descriptive statistics, histograms of relative frequencies for each variable, and frequency distribution tables. The analysis specifically provided the following:

1. A mean for Questions 9 and 13 to determine classification of team members into the groups more effective and less effective.

2. A breakout of Question 1 to determine the number of individuals in each position on the Should Cost team.

3. Descriptive statistics to evaluate Questions 45-47 that were directed at Team Chiefs and Deputy Team Chiefs.

T-TEST. The t-test is a commonly used test for the analysis of two independent samples. The t-test determines the significance of the difference in the means between two independent data samples (6:423). Significance in this case means identifying a true difference between populations (17:267).

Assumptions. Assumptions for the t-test include the following (10:147):

1. Normal parent population. According to the Central Limit Theorem, regardless of the shape of the original population, the sampling distribution of the mean will approach normality as sample size gets large. Large is normally considered greater than thirty.

2. Independent samples.

3. Equal variances.

Equation. If the variances of a normal parent population are equal, the t-statistic is calculated using the following (17:269):

$$t_{(N_1+N_2)} = \frac{(\bar{X}_1 - \bar{X}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{(N_1-1)S_1^2 + (N_2-1)S_2^2}{N_1+N_2-2}\left(\frac{N_1+N_2}{N_1N_2}\right)}}$$

where:

N_1 = sample size of sample one.
N_2 = sample size of sample two.
$\bar{X}_1$ = sample mean of variable X_1.
$\bar{X}_2$ = sample mean of variable X_2.
μ_1 = population mean for variable X_1.
μ_2 = population mean for variable X_2.
S_1 = sample variance for X_1.
S_2 = sample variance for X_2.

When normal populations have unequal variances, the t-statistic cannot be computed for the differences in the sample means. Instead, the t-statistic must be approximated using the following (17:270):

$$t = \frac{(\bar{X}_1 - \bar{X}_2) - (\mu_1 - \mu_2)}{\sqrt{\frac{S_1^2}{N_1} \quad \frac{S_2^2}{N_2}}}$$

Output. The output of the T-TEST includes a pooled variance estimate and a separate variance estimate. The pooled estimate determines significance when variances are equal, and the separate estimate determines significance when variances are unequal. Both estimates provide t-values and 2-tailed probabilities. To determine which variance

estimate to use, one must consult the F value computed by the T-TEST subroutine. When the value for F is greater than alpha, the variances are considered equal and the pooled variance estimate should be used. Otherwise, the separate variance estimate is appropriate (17:270).

Discriminant Analysis. Discriminant Analysis determines the statistical difference between two or more groups based on a collection of selected "discriminating" variables. Mathematically, Discriminant Analysis attempts to weigh and linearly combine the discriminating variables into groups which are as statistically distinct as possible. In other words, it attempts to "discriminate" between the groups in the sense of being able to tell them apart (17:434). Discriminant Analysis accomplishes the "separation" through a discriminant function of the following form (17:435):

$$D_i = d_{i1} Z_1 + d_{i2} Z_2 + \ldots + d_{ip} Z_p$$

where:

D_i = score on discriminant function.
d_{ip} = weighting coefficients.
Z_p = standardized discriminant variables.

The discriminant function provides useful information about the power of the set of variables selected for separating or discriminating observations from several groups (16:7-43).

The maximum number of discriminant functions possible is either equal to the number of discriminating variables or one less than the number of groups, whichever is smaller (17:442). The current research produced only one discriminant function since the research involves only two groups.

Assumptions. Discriminant Analysis assumes that discriminant variables have two characteristics (17:435):

1. A multivariate normal distribution.
2. Equal covariance matrices within each group.

The two assumptions need not be strongly adhered to because the technique is extremely robust given equal group populations (17:435). A procedure is statistically robust when it is insensitive to slight violations of the assumptions on which it is based (15:307).

Hotelling T^2. Before developing the discriminant function, SPSS determines whether the defined groups of interest, for example effective and ineffective Should Cost planning, are significantly different with respect to their multivariate descriptors. If the groups of interest are found to be significantly different, DISCRIMINANT will procede with the analysis. The analysis is the multivariate equivalent to the two sample t-test of the population means. A sample vector called a centroid, which is similar to a mean, is determined for each population. The null hypothesis, that the population centroids are equal, is

tested using the Hotelling T^2 statistic (16:7-37).

$$T^2 = \left(\frac{n_1 n_2}{n_1+n_2}\right)\left(\bar{\underline{X}}_1 - \bar{\underline{X}}_2\right)' S_w^{-1} \left(\bar{\underline{X}}_1 - \bar{\underline{X}}_2\right)$$

where:

n_1 = sample size from a multivariate normal population.

n_2 = sample size from a multivariate normal population.

$\bar{\underline{X}}_1$, $\bar{\underline{X}}_2$ = element vectors from the two populations.

$x_{ij} \sim N(\underline{\mu}, \Sigma_i)$ $ij = 1,2,3,n$

μ_i = vector element centroid.

Σ_i = covariance matrix common to the two distributions.

$'$ = transpose of a matrix.

S_w^{-1} = within groups covariance matrix.

Calculating Discriminant Function Coefficients. Once the Hotelling T^2 statistic ascertains that the two groups are indeed distinguishable, discriminant coefficients are calculated for each of the discriminants (17:443). Survey questions represent the discriminants for the research. The coefficients correspond to the $d_{i\rho}$'s given in the previously defined equation for the discriminant function.

Solving for the coefficient of the discriminant function involves the use of the following equation (16:7-18):

$$A\underline{a} = \lambda W\underline{a}$$

where:

$\underline{a}$ = p element eigenvector.
A = among group differences of the sum-of-squares and the cross product matrices.
W = within group sum-of-squares and cross product matrices.
λ = eigenvalue.

A more detailed explanation of multivariate analysis is available in Charles W. McNichols' text, Applied Multivariate Analysis (16).

Discriminant Function Coefficients. Discriminant coefficients and discriminant scores in standard form determine a survey respondent's discriminant function value. The function score is computed by multiplying a discriminating variable by its corresponding coefficient and summing the products (17:443). Each respondent or case will have a separate score as the value of the discriminant function.

Discriminant coefficients are in standard form with a mean of zero and a standard deviation of one. Therefore, a discriminant function score D_i, represents the number of standard deviations from the mean. Averaging D_is of all respondents within a particular group results in a group centroid or group mean. The group centroid represents the most likely location for a respondent if a member of that particular group. A comparison of the means identifies the

amount of separation between the two groups (17:443).

Discriminant coefficients furnish important analytical information concerning their representative question or factor. The absolute value of a coefficient represents its relative contribution to the discriminant function. The coefficient value is analogous to the interpretation of beta weights in multiple regression (17:443). For example, a discriminant coefficient with a value of -0.428 means the discriminant predicts or explains 42.8 percent of the discriminant function.

Classification. In addition to analytical procedures, Discriminant Analysis also offers a powerful classification technique. It calculates a classification function based on the values of the discriminant variables. The function predicts group membership for a respondent not in the current database. Although the research effort is not concerned with classifying individuals into the groups effective and ineffective, the classification procedure offers some useful information (17:445).

The classification procedure tests the adequacy or power of the derived discriminant functions. It uses current variables in a test procedure to classify the original set of cases to determine how many were correctly assigned. The test procedure involves using each group's discriminant variables in a linear combination. Test results are reported as a percentage correctly classified.

The percentage measure indicates the strength or the predicting capabilities of the discriminant function (17:446).

Analysis Procedure. In many cases, the full set of independent variables used to comprise the discriminant function contains excess information about group differences. Some variables may not even be useful discriminators. The stepwise procedure, available through Discriminant Analysis, eliminates the problem and reduces the set of discriminants by sequentially selecting the next best discriminator (17:447).

Initially, the process chooses the single best predictor variable based on established selection criteria. Next, the initial variable is paired against each of the other variables to determine the next best descriptor. Pairing continues, resulting in a growing number of discriminant variables. Since the process is a multivariate approach, some variables are excluded or loose their power to predict as other variables enter the equation (17:447). The process repeats until no other variable qualifies to enter. In this way, the best possible discriminators are selected and ranked in order of prediction capability.

Method. The research employed the Mahalonobis method to determine the selection of the discriminants. According to Dr. McNichols, the Mahalonobis method (16:7-48):

> . . . calculates the distance of a multivariate observation from the centroid of a multivariate normal population while accounting for the effects of the population covariance structure.

The procedure seeks to maximize the Mahalonobis distance between the two closest groups using the following equation (16:7-47):

$$D^2 = (\underline{X}_i - \underline{\bar{X}}_K)' \sum (\underline{X}_i - \underline{\bar{X}}_K)$$

where:

$\underline{x}_i$ = ith observation to be classified.
$\underline{x}_K$ = centroid of the Kth group.
$\sum$ = the covariance matrix for the variables x.

Discriminant Function Importance. The DISCRIMINANT subprogram provides measures for judging the importance of the discriminant function. One measure is the relative percent of the eigenvalue associated with the function. The eigenvalue, calculated during the discriminant function computations, measures the relative importance of the function. The sum of eigenvalues measures the total variance existing within the discriminant variables. For a single discriminant function, as is this case, the eigenvalue is expressed as a percent. The percent value gives an indication of the associated function's relative importance (17:442). In other words, it tells how good a job the discriminant function does in discriminating.

Another indication of the importance of a discriminant function is the canonical correlation. The canonical correlation measures the association between the discriminant function and the variables which define group membership. It too measures the discriminant function's ability to discriminate among groups. The squared canonical correlation can be thought of as the portion of the variance in the discriminant function explained by the groups (17:442).

A final evaluation of the discriminant function is Wilks' Lambda. Lambda is an inverse measure of the discriminating power in the original variables that has not been removed by the discriminant function. The larger the value of Lambda, the less the amount of unexplained information remaining (17:442). Thus a large Lambda means a discriminant function is capable of discriminating.

Statistical Significance

Tests of statistical significance indicate whether or not observed relationships actually exist (17:222). Significance levels are actually probability levels. The significance level established for the research effort is an alpha of 0.05. In cases, where the observed significance is less than 0.05, the null hypothesis is rejected.

Research Objectives

The following is a discussion of research objectives,

appropriate hypotheses, specific survey questions applicable to each objective, and statistical analyses used to accomplish the objectives.

Objective One. Identify significant differences between Should Cost supervisors' and nonsupervisors' perceptions of Should Cost planning.

Hypotheses:

Ho : There is no difference in question responses between supervisors and nonsupervisors.

Ho : $\mu_1 = \mu_2$. Reject if significance is < 0.05.

Ha : There is a difference in question responses between supervisors and nonsupervisors.

Ha : $\mu_1 \neq \mu_2$

Survey Question 1, concerning the roles performed in the Should Cost, was used to dichotomize team members into the independent groups, "supervisor" and "nonsupervisor." Question 1 follows:

1. My role in the Should Cost effort was:
   1. Team Chief
   2. Deputy Team Chief
   3. Operations Officer
   4. Subteam Leader
   5. Team Worker
   6. Other

If a team member held the position of Team Chief, Deputy Team Chief, Operations Officer, or Subteam Leader, the individual was placed in the "supervisor" group. Otherwise, the team member was placed in the "nonsupervisor" group.

A t-test performed against the dichotomy supervisor/nonsupervisor determines the differences the groups had on various questions dealing with Should Cost

planning. The analysis evaluates team members' responses to Questions 4-37.

Objective Two. Identify significant differences between the perceptions of Should Cost team members classifying planning as "effective" and those classifying planning as "ineffective."

Hypotheses:

Ho : There is no difference in question responses between individuals classifying planning as effective and those classifying planning as ineffective.

Ho : $\mu_1 = \mu_2$. Reject if significance is < 0.05.

Ha : There is a difference in question responses between individuals classifying planning as effective and those classifying planning as ineffective.

Ha : $\mu_1 \neq \mu_2$.

Survey Question 9, dealing with perceived effectiveness, was used to dichotomize team members into the independent groups "effective" and "ineffective." A direct question, such as "Was Should Cost planning effective," was not used in order to control for respondent bias. The researchers felt that respondents would be hesitant to admit that their planning efforts were less than fully effective. Instead, respondents were asked to evaluate the essentiality of Should Cost planning for a successful on-site visit. Since only effective planning would be essential, respondents who perceived the Should Cost planning effort as essential were classified as perceiving the planning process

as effective.

Question 9 follows:

> 9. The Should Cost planning process proved essential for a successful on-site visit.

Question 9 responses were divided into two groups based on the mean established by the FREQUENCIES subprogram. The mean established the two groups more effective and less effective. Division of the groups occurred at two or less for "effective" and three or greater for "ineffective."

A t-test performed against the dichotomy effective/ineffective determines the perceived differences the groups have on various questions dealing with Should Cost planning. The analysis evaluates team members' responses to Questions 4-8 and 10-37.

Objective Three. Identify a rank ordering of key discriminants of effective/ineffective Should Cost planning as determined by perceptions of Should Cost participants.

Two Discriminant analyses were performed under Objective Three. The first analysis was performed on the evaluation of Should Cost as more effective or less effective as determined by survey Question 9. The groups were formed by dividing Question 9 responses at the mean established by the FREQUENCIES subprogram. Division occurred at two or less for "effective" and three or greater for "ineffective." Key discriminants of Should Cost planning were determined for the groups based on responses

to Questions 1-8 and 10-37. The second analysis was performed comparing the groups who considered the advance team visit more effective or less effective as determined by survey Question 13. The groups were formed by dividing Question 13 responses at the mean established by the FREQUENCIES subprogram. Division occurred at two or less for "effective" and three or greater for "ineffective." Key discriminants of Should Cost planning were determined for the groups based on responses to Questions 38-44.

Before Discriminant Analysis can be performed in either of the above cases, the statistical difference between the two groups "effective" and "ineffective" must be established using the Hotelling T^2 statistic. The following hypotheses must be evaluated for each test before Discriminant Analysis can proceed.

Hypotheses:

Ho: There is no difference between the population centroids effective/ineffective as defined in terms of the survey questions.
Ho: $\underline{\mu}_1 = \underline{\mu}_2$

Ha: There is a difference between the population centroids effective/ineffective as defined in terms of the survey questions.
Ha: $\underline{\mu}_1 \neq \underline{\mu}_2$

where:
$\underline{\mu}_1$ = the population centroid for group one.
$\underline{\mu}_2$ = the population centroid for group two.

Objective Four. Evaluate Team Chief and Deputy Team Chief perceptions of Should Cost management authority and

guidance.

Questions 45-47, dealing with Should Cost management authority and guidance, pertain only to Team Chiefs and Deputy Team Chiefs. Due to the small number of individuals in the two categories, statistical analysis was limited. However, analysis of the questions does have a bearing on the Should Cost planning process. Therefore, FREQUENCIES was employed to determine the weight of the respondent's perceptions in the areas. Comments were also an important consideration for the analysis.

Objective Five. Evaluate sources of information Should Cost team members stated were the most helpful in the Should Cost planning process.

Accomplishment of the objective consists of collating numerous comments made by Should Cost personnel to open-ended survey Question 48. The question is designed to ascertain Should Cost personnel's perceptions of useful planning information.

Question 48 follows:

> 48. What sources of information were helpful in SC planning?

Objective Six. Evaluate areas of Should Cost planning that team members stated as needing improvement.

Accomplishment of the objective consists of collating various comments made by Should Cost personnel to open-ended survey Question 49. The question is designed to ascertain

those areas of the planning process that team members feel need improvement.

Question 49 follows:

> 49. Do any areas of Should Cost planning need improvement?

Summary

The purpose of the research was to identify key variables of planning as perceived by former Should Cost team members. To collect data for the research, the researchers developed a questionnaire to measure team members' perceptions of effectiveness during the planning phase of Should Cost. AFP 70-5, "lessons learned," and interviews provided inputs for development of the questionnaire.

Four current Air Force Should Cost programs were selected as the population of interest. A total of 136 questionnaires were distributed to individuals who participated in the four Should Cost studies. The questionnaires provide the essential data needed to accomplish the research.

The research methodology included both statistical analysis and subjective evaluation. Three subprograms were selected from the SPSS program package to analyze the data: FREQUENCIES, T-TEST, and DISCRIMINANT. Research Objectives One and Two were considered through the use of t-tests while Research Objective Three was considered through the use of

Discriminant Analyses. Research Objectives Four, Five, and Six were considered by subjective evaluation of responses to a variety of questions on Should Cost planning.

IV. Analysis and Results

The purpose of the chapter is to present the results of the analyses discussed in Chapter III. In doing so, the following four areas will be addressed:

1. Survey response.
2. Demographic information.
3. Variables of interest.
4. Research Objectives One through Six.

Survey Response

The researchers sent out 136 surveys to previous Should Cost team members. Of the total, 89 completed surveys were returned. The completed surveys represented greater than a 65 percent response rate. Nine surveys returned unanswered due to either retirement or reassignment with no forwarding address. Two individuals, whose names had appeared on a team roster, returned their survey unanswered stating that they had not been an active participant in the Should Cost.

Demographic Information

Questions 1-3 of the questionnaire addressed demographic information. All three questions were evaluated by Discriminant Analysis to ensure that the variables did not influence survey responses. Discriminant Analysis failed to include any of the demographic questions as discriminators of the Should Cost planning process.

Question 1. Question 1 ascertained the position a participant held during the Should Cost effort. Question 1 follows:

1. My role in the Should Cost effort was:

1. Team Chief 2. Deputy Team Chief 3. Operations Officer 4. Subteam Leader 5. Team Worker 6. Other (explain)

The researchers felt that the position an individual held during the Should Cost was an important consideration and could generate differing views with respect to the Should Cost planning effort. The theory was tested in two ways. The first test was by Discriminant Analysis during Research Objective Three. The purpose of the test was to determine if a team member's position could be a discriminator of the individual's perceptions toward the planning process. In the second test, Question 1 served as the variable of interest for Research Objective One and was evaluated against survey Questions 4-37. The role of Question 1 as the variable of interest will be discussed in greater detail under the heading Variables of Interest.

Table III breaks out the 89 survey respondents by team position. The six individuals who responded "Other" held one of the following positions: Price Analyst; Logistics Support; Technical Consultant; Secretary; Manufacturing Consultant; and Computer Support.

TABLE III

Role in Should Cost

Position	Number
Team Chief	10
Deputy Team Chief	3
Operations Officer	1
Subteam Leader	21
Team Worker	48
Other	6
Total	89

Question 2. Question 2 addressed whether an individual was or was not in the military. Question 2 follows:

2. During the Should Cost, I was:

1. Military 2. Government employee 3. Civilian consultant 4. Other (explain)

The researchers were interested in determining whether or not being military had an impact on the results of the planning effort. Question 2 was evaluated through Discriminant Analysis to determine if a team member's status could be a discriminator of the individuals perceptions of the planning process.

A Should Cost effort is performed by many different groups as the responses for Question 2 indicate. Table IV presents a breakout of the 89 survey respondents.

TABLE IV

Status in Should Cost

Status	Number
Military	14
Government Employee	73
Civilian Consultant	2
Total	89

Military members tend, by nature of the assignment system, to be more transient in job position. Therefore, they are not as likely to be continually involved in Should Costs. Thus, the corporate knowledge of the Should Cost effort, and ultimately the planning effort, could be degraded. On the other hand, Government employees who are associated with the Should Cost field participate more permanently. They tend to be involved with Should Costs throughout their entire career. A new and important development in the Should Cost arena is the introduction of civilian consultants. Consultants perform analyses in areas requiring special expertise or in some cases they are used simply to reduce the manpower requirements for government personnel.

Question 3. Question 3 addressed the method by which

an individual became a team member. Question 3 follows:

3. How were you selected for the Should Cost?

1. Volunteer 2. Supervisor 3. Team Chief
4. Computer 5. Other (explain)

Table V presents a breakout of the selection methods for the survey respondents.

TABLE V

Selection for Should Cost

Selection Method	Number
Volunteer	12
Supervisor	50
Team Chief	22
Computer	0
Other	5
Total	89

The researchers felt it important to ascertain the means by which an individual became a team member. It was important to determine if random selection, for example, could be an indicator of an individual's perceptions toward the Should Cost effort. Question 3 was evaluated through Discriminant Analysis. An additional point of interest the researchers monitored was the number of individuals selected by the Team Chief. According to AFP 70-5, it is the right and responsibility of the Team Chief to select team members

(25:3-3). FREQUENCIES indicated that less than 25 percent of the individuals surveyed were selected by the Team Chief. The five individuals who responded "Other" were selected by the following methods: 1) USAF or DOD request for agency participation and 2) selection by consulting firm.

Variables of Interest

For the research, Questions 1,9, and 13 provided the three variables of interest. The variables of interest were used to provide groupings for statistical analysis of the research objectives.

Question 1. Question 1 served as the variable of interest for the t-test of Research Objective One. The researchers elected to divide Question 1 responses into two groups. Anyone selecting question responses one through four, was categorized as being a supervisor. Thus "Supervisor" served as group one for the analysis and included 35 respondents. The individuals not holding supervisory roles, or selecting question response five, were categorized as nonsupervisor. All six individuals who selected question response "Other" were classified as nonsupervisors. "Nonsupervisor" formed the basis for group two in the analysis and included 54 respondents.

Question 9. Question 9 served as the variable of interest for the t-test analysis of Research Objective Two and for the Discriminant Analysis of Research Objective

Three. Question 9 follows:

> 9. The Should Cost planning process proved essential for a successful on-site visit.

A mean for Question 9 of 2.2, obtained from the descriptive statistics of the FREQUENCIES subprogram, served as the point of division for the two groups of interest. Group One for the analysis consisted of 58 respondents. The individuals selected responses one or two indicating that they perceived planning as more effective. Group one is referred to as the "Effective" group. Group two included the individuals who selected responses three through seven. A response in the category indicated that they perceived planning as less effective. Group two is referred to as the "Ineffective" group and included 27 respondents. The total responses to Question 9 is only 85 because four individuals failed to answer the question.

Question 13. Question 13 served as the variable of interest for the Discriminant Analysis that addressed the importance of the advance team. Question 13 follows:

> 13. An advance team visit is necessary to enhance SC planning.

The mean for Question 13 of 1.8, obtained from the descriptive statistics of the FREQUENCIES subprogram, was used to establish the two groups of interest. Only those individuals participating in the advance visit were included in the analysis. A total of twenty-eight participants were divided into the two groups more effective and less

effective. Since respondents selected whole numbers on the questionnaire, the researchers rounded the mean of 1.8 up to 2. Therefore, individuals selecting responses one or two were classified as "Effective" and comprised Group One for the analysis. Individuals selecting responses three through seven were classified as "Ineffective" and comprised Group Two for the analysis.

Research Objective One

Research Objective One identifies significant differences between Should Cost supervisors and nonsupervisors perceptions of Should Cost planning.

Hypothesis:

Ho : There is no difference in question responses between supervisors and nonsupervisors.

Ho : $\mu_1 = \mu_2$. Reject of significance is < 0.05.

Ha : There is a difference in question responses between supervisors and nonsupervisors.

Ha : $\mu_1 \neq \mu_2$.

Overview. Survey Question 1 served as the variable of interest for the research objective and was evaluated using the t-test analysis. The means for Questions 4-37 were compared to determine if any perceived differences existed between the two groups formed by the division of Question 1 responses. If the comparison between questions resulted in a significance level less than the alpha of 0.05, the null hypothesis was rejected and a perceived difference was

assumed. Six questions with significance less than the alpha of 0.05 were identified by the t-test. Asterisked (*) questions in Table VI indicate significant results of Research Objective One.

Significant Questions and Comments.

8. The SC plans had enough flexibility to allow for changes and problems.

Comments. Supervisor ratings indicated that they perceived flexibility present to a higher degree than nonsupervisors. Supervisors stated that they were able to proceed in new directions when the situation warranted. However, they felt that flexibility was somewhat dependent upon contractor cooperation. Nonsupervisors noted that some areas required a change of plans. They felt that the flexibility to change was limited by strict compliance with the plan and contractor inflexibility.

23. The master schedule was useful in helping prepare detailed plans.

Comments. Supervisors indicated that considerable effort went into the development of the master schedule, and it was essential for scheduling team member participation. Nonsupervisors did not comment.

24. AFP 70-5, Should Cost, provided valuable guidance for SC planning.

Comments. Supervisors generally considered the pamphlet well written. One supervisor commented that AFP 70-5 was "one of the finest AF pamphlets written."

TABLE VI

Research Objective One Summary

Question	Significance	Overall Mean	Super Mean	Nonsuper Mean
4	.256	2.91	2.62	3.10
5	.767	3.61	3.69	3.57
6	.115	1.97	1.69	2.16
7	.062	2.62	2.29	2.84
8*	.049	2.42	2.09	2.65
10	.530	2.90	2.73	3.00
11	.340	2.64	2.47	2.76
12	.954	4.10	4.12	4.09
13	.067	2.10	1.74	2.33
14	.912	2.44	2.42	2.45
15	.121	3.55	3.21	3.77
16	.181	5.43	5.71	5.25
17	.103	2.32	2.06	2.48
18	.414	3.33	3.15	3.44
19	.346	2.84	2.66	2.96
20	.327	2.92	1.29	1.80
21	.919	2.51	2.49	2.53
22	.237	2.64	2.41	2.79
23*	.046	2.58	2.20	2.83
24*	.009	3.12	2.62	3.45
25	.087	2.73	2.47	2.90
26	.135	2.63	2.29	2.85
27	.506	2.67	2.53	2.75
28*	.003	2.06	1.55	2.38
29*	.014	3.46	2.79	3.89
30*	.000	3.11	2.47	3.53
31	.387	2.25	2.09	2.35
32	.653	2.22	2.31	2.15
33	.283	2.78	2.56	2.92
34	.267	2.70	2.47	2.85
35	.439	3.14	2.97	3.25
36	.904	3.08	3.06	3.09
37	.252	2.22	2.03	2.35

* Indicates significant results.

Nonsupervisors were not as complimentary. They felt that AFP 70-5 was too general to provide meaningful guidance. Some team members commented that they were not provided copies of AFP 70-5 while developing their plans.

28. Logistics support considerations for the facility visit were adequately addressed during planning.

Comments. Supervisors indicated that they considered such logistics functions as work environment, people comforts, and non-duty hour activities as important as the mission objectives. Responses indicated that supervisors were satisfied that the areas were adequately addressed. Nonsupervisors did not agree as strongly as supervisors on the issue. They specifically mentioned lodging and transportation needs specifically more emphasis.

29. I was able to dedicate my full time to the SC planning.

Comments. Both groups indicated that interruptions and requirements to perform duties outside of the Should Cost were a hindrance to full time participation. Nonsupervisors stated that they were required to work at their primary duties during the planning phase and were not allowed to dedicate full time to the Should Cost until arriving on-site.

30. The planning documents I prepared proved effective during the on-site visit.

Comments. Supervisors made no comments on the question. One nonsupervisor commented that "lack of

familiarity with the contractor caused minor problems." The statement is an indication that for planning documents to be effective on-site, the participants must know about the contractor's operations during planning.

Research Objective Two

Research Objective Two identifies significant differences between the perceptions of Should Cost team members classifying planning as "effective" and those classifying planning as "ineffective."

Hypotheses:

Ho : There is no difference in question responses between individuals classifying planning as effective and those classifying planning as ineffective.

Ho : $\mu_1 = \mu_2$. Reject if significance is < 0.05.

Ha : There is a difference in question responses between individuals classifying planning as effective and those classifying planning as ineffective.

Ha : $\mu_1 \neq \mu_2$.

Overview. Question 9 served as the variable of interest for Research Objective Two. The t-test evaluated survey Questions 4-8 and 10-37 to determine if any perceived differences existed with respect to the two groups formed by the division of Question 9 responses. Means for the questions were compared and considered significant if the significance level was less than the alpha of 0.05. In such cases, the null hypothesis was rejected and a perceived

difference was assumed. The t-test identified twenty-five variables as significant.

Due to the large number of questions identified as significant, the researchers will discuss in detail only those questions with meaningful respondent comments. Table VII denotes the twenty-five significant questions of Objective Two by asterisks. Also marked are significant questions of Objectives One (#) and Three (@). Objective Three results will be discussed under Discriminant Analysis.

Significant Questions and Comments.

6. Detailed plans were a necessity for an effective SC.

Comments. The effective group stated that detailed plans make it possible for the team to evaluate the proposal. The ineffective group did not concur. They stated that detailed planning did not allow for flexibility which they thought was essential for an effective Should Cost. The need for flexibility was also echoed in other comments. The point was made that throughout a Should Cost, there is a constant requirement to evaluate and modify pre-planning.

7. We followed the plans we developed.

Comments. The only meaningful comments came from the effective group. They stated that plans were followed as much as possible; however, like the ineffective group of Question 6, their plans were constantly being adapted or

TABLE VII

Research Objective Two Summary

Question	Significance	Overall Mean	Effect Mean	Noneffect Mean
4	.098	2.91	2.65	3.40
5	.273	3.61	3.48	3.96
6*	.000	1.96	1.52	2.88
7*	.000	2.61	2.17	3.44
8*@#	.000	2.42	1.98	3.22
10	.662	2.90	2.88	3.08
11*	.019	2.64	2.45	3.19
12	.914	4.10	4.07	4.12
13*	.034	2.10	1.87	2.56
14*	.007	2.44	2.23	2.96
15*@	.029	3.55	3.30	4.15
16*	.044	5.52	5.74	5.04
17*@	.000	2.31	1.96	3.12
18*	.021	3.33	3.07	3.96
19*	.007	2.84	2.55	3.46
20	.324	2.92	2.82	3.19
21	.054	2.51	2.19	3.04
22*	.000	2.64	2.19	3.41
23*#	.000	2.58	2.12	3.44
24*@#	.000	3.11	2.63	3.93
25*	.000	2.72	2.39	3.42
26*	.012	2.62	2.26	3.22
27*	.029	2.66	2.40	3.15
28*#	.012	2.05	1.81	2.58
29*#	.037	3.46	3.11	4.07
30*#	.000	3.10	2.68	3.85
31	.142	2.25	2.03	2.48
32	.417	2.22	2.10	2.42
33*	.001	2.77	2.42	3.56
34*@	.000	2.69	2.23	3.59
35*@	.001	3.14	2.74	3.93
36*	.001	3.08	2.74	3.77
37*	.027	2.22	2.00	2.69

* Indicates significant results.
@ Discussed under Research Objective Three.
\# Indicates significance under Research Objective One.

modified to meet the situation. One individual said that new plans were required because a problem area required more research. It was also pointed out that the contractor can sometimes cause the best of plans to go awry, and thus make the following of any plans a difficult task.

11. Good coordination and lines of communications existed with the government team during planning.

Comments. No meaningful comments.

13. An advance team visit is necessary to enhance SC planning.

Comments. The effective group generally responded favorably concerning the necessity for an advance team. One individual commented that the advance visit allows the Team Chief and team leaders to gain knowledge regarding the contractor prior to the full team visit. The ineffective group did not answer as positively about the need for an advance team visit. One ineffective group member stated that the advance team visit could be replaced by allowing the entire team to arrive one day before initiation of the Should Cost effort. The issue of the advance team visit is further examined under Research Objective Three.

14. Team composition was adequate to conduct the SC planning effort.

Comments. The effective group commented that additional participation from Air Force personnel and additional support from Logistics Command personnel could benefit the effort. One team member stated that the

additional military personnel should be used in lieu of civilian consultants. Another comment stated that a small cadre should be used to prepare the long range plans that establish guidelines for the entire team. Only one comment was made by the ineffective group. The individual indicated satisfaction with team composition.

16. The SC team did not meet often enough to ensure proper planning and coordination.

Comments. The effective group stated that daily meetings were absolutely essential to maintain communication and team enthusiasm. One comment suggested that the week prior to the Should Cost visit, meetings be held at a location that would prevent outside distractions. A time of isolation would allow individuals the opportunity to devote their entire time to the planning effort. Overall, the effective group felt that the team could not have too many meetings; whereas, the ineffective group felt that the team had too many meetings.

18. A good relationship existed between the government and the contractor.

Comments. Although responses differed with respect to the question, the comments appeared similar. Team members commented that both government and contractor personnel perceived the presence of an adversarial relationship. Comments indicated that working relationships tended to be good initially, but by the time responses went through the management screening process, things changed.

19. Individual team members had adequate knowledge and skills to accomplish the task.

Comments. A general comment appearing in both groups was that there was a lack of experience on the team. As a result, quite a bit of time was spent defining individual tasks.

22. The master schedule was clearly designed and available to all team members early in the planning.

Comments. No meaningful comments.

23. The master schedule was useful in helping prepare detailed plans.

Comments. The effective group indicated that considerable effort went into the development of the master schedule, and it was essential for scheduling team member participation. The ineffective group did not comment. The question also appeared in Research Objective One. Combining the results of both objectives, the effective supervisor group answered most favorably.

25. The organizational structure allowed for effective and efficient accomplishment of the planning.

Comments. No meaningful comments.

26. My specific task was adequately defined.

Comments. The effective group stated that tasks were adequately defined. Comments from the ineffective team members revealed that adequate guidance was lacking from the subteam chief level.

27. I received adequate management guidance in conducting my planning efforts.

Comments. Generally, comments indicated that management guidance was lacking. One individual commented that guidance and feedback could be improved if daily briefings were held to keep team members updated on problems associated with planning and progress of the effort.

28. Logistics support considerations for the facility visit were adequately addressed during planning.

Comments. The effective group indicated that logistics functions such as work environment, people comforts, and non-duty hour activities are as important as the mission objectives. Responses indicated that the effective group was satisfied that the areas were adequately addressed. The ineffective group did not agree as strongly as the effective group on the issue. The issue was also highlighted under Research Objective One. Overall, the effective supervisor group indicated the strongest support for the question.

29. I was able to dedicate my full time to the SC planning.

Comments. Comments on the question were highlighted in Research Objective One. Overall, both the effective and ineffective groups stated that they were not totally released from their other jobs until arriving on-site.

30. The planning documents I prepared proved effective during the on-site visit.

Comments. The effective group indicated that the

planning documents proved effective during the on-site visit. Comments were very limited on the question. One effective group member stated that lack of knowledge of the contractor caused some difficulty. An ineffective group member stated that the contractor had difficulty understanding carefully prepared questions. The question was also discussed under Research Objective One. Both comments came from the nonsupervisor group.

33. I was given sufficient time to develop my plans.

Comments. No meaningful comments.

36. Feedback was useful in improving my plans.

Comments. No meaningful comments.

37. A common data bank of SC information should be available for planning efforts.

Comments. The effective group strongly favored the establishment of a data bank for Should Cost. Comments indicated that Team Chiefs should be responsible for providing a summary of problem areas and "lessons learned" and that the information should be accessible to all.

Research Objective Three

Research Objective Three identifies a rank ordering of key discriminants of effective/ineffective Should Cost planning as determined by perceptions of Should Cost participants. Discriminant Analysis was performed on two separate groups under the objective. Test one evaluated the planning process of the whole team while test two evaluated

the planning process of the advance visit.

Overview for Test One. The first Discriminant Analysis used Question 9 as the variable of interest. Survey Questions 1-8 and 10-37 were evaluated to determine which of the questions would most discriminate between the two groups formed by Question 9 responses. Ten questions were identified and ranked in the order of their ability to discriminate. Table VIII presents the questions as determined by the stepwise method. The absolute value of the coefficient for each question represents the percentage or relative contribution that question possesses in the discriminating function. In other words, the coefficients identify the variables which contribute most to differentiation.

TABLE VIII

Research Objective Three Test One Summary

Question	Discriminant Coefficient
8	.96
24	.66
35	.52
34	.49
17	.43
21	.41
31	.40
15	.39
20	.34
10	.27

Using the variables of Table VIII Discriminant Analysis develops a classification function that predicts group membership for new cases with unknown membership. For the research, the predictions of the classification function were correct 85 percent of the time. The aim of the research was not to classify individuals. However, classification provides an evaluation of the adequacy of the discriminant variables to discriminate. The classification score in percentage form gives the capability of the discriminant variables to discriminate. A percentage as high as 85 implies that the variables identified are very good predictors of planning effectiveness and should be afforded special attention during any planning process.

Significant Questions and Comments.

8. The SC plans had enough flexibility to allow for changes and problems.

Comments. The question was significant in Objectives One and Two. The effective group felt that their plans allowed for sufficient flexibility. The ineffective group stated that flexibility was limited due to contractor restrictions and an unwillingness of supervisors to deviate from the plans.

24. AFP 70-5, Should Cost, provided valuable guidance for SC planning.

Comments. The question was significant in Objectives One and Two. The effective group made positive comments concerning the pamphlet. The pamphlet was

considered good general guidance, but its use must be tailored to fit the needs of the Should Cost. Also, the effective group suggested that the pamphlet be made available to all team members during the planning phase.

35. I was provided sufficient feedback on my plans.

Comments. The effective group felt that they were provided sufficient feedback on their plans. One effective group member stated that the team's actions were thoroughly tracked and discussed during briefings. The ineffective group felt that more feedback was necessary. One team member commented that once a plan was submitted, it was accepted and filed without any feedback.

34. There were controls to monitor the progress and accomplishment of plans.

Comments. The effective group felt that there were sufficient controls to monitor the progress and accomplishment of plans. They identified the following factors to be important controls for planning: 1) daily meetings with the Team Chief to chart progress; 2) continual involvement of team leaders in monitoring plans; 3) setting of deadlines to ensure completion of plans on time; and 4) frequent team meetings to ensure personal interchange of information. The ineffective group commented that controls were not established early enough in the program to ensure proper monitoring.

17. Subteam planning efforts were useful in developing the individual plans.

Comments. The effective group commented that subteam planning efforts were very useful in developing individual plans. Subteam planning was strictly adhered to and provided extra insight to what other team members were doing. The ineffective group tended to agree with the question, but not as intensely as the effective group. As indicated by their comments, the ineffective group was not as concerned about emphasis on subteam planning.

21. The Team Chief should be a colonel/GS-15 or higher.

Comments. The effective group felt that holding a high rank was an important requirement for a Team Chief. Specifically, they felt that grade was an indicator of the importance that the government placed on the effort. Also, rank gave the Team Chief more support from superiors and the necessary attention of the contractor. The ineffective group considered rank less important than technical knowledge and irrelevant if the contractor was cooperative.

31. I was given full responsibility and authority to accomplish my task.

Comments. The effective group felt that they were given the responsibility and authority to accomplish their tasks. One team member commented that having the Team Chief's support for decisions helped in task accomplishment. The point was also made that authority and responsibility should be limited for team members who lack experience and skill in Should Cost. An ineffective group comment

addressed lack of authority. One supervisor stated that the authority to obtain the manpower necessary to accomplish the task was not given.

15. The contractor was familiar with our purpose and provided adequate support.

Comments. Both the effective and ineffective groups commented that the contractor was familiar with the purpose of the Should Cost; however, they felt the contractor did not provide adequate support. Both groups reported that the contractor was slow to provide requested information.

20. Previous SC experience is essential to a successful SC effort.

Comments. Both the effective and ineffective group felt that previous experience is essential to a successful Should Cost effort. The effective group commented that at higher levels in the team structure, especially the Team Chief or Deputy Team Chief levels, previous Should Cost experience is essential. The effective group also thought that it was vital for team members in management positions, to possess experience in order to know what to expect on a Should Cost. Even though the ineffective group rated the area lower, their comments tended to mirror those of the effective group.

10. I had knowledge of the contractor's facility, operations, and on-going activities to help me in planning.

Comments. Many supervisors in the effective group

either participated in the advance visit or had access to the advance visit findings. Comments indicated that the information was useful for planning purposes. The ineffective group stated that they had little information concerning the contractor's facilities prior to the planned visit. One individual expressed the opinion that the team members who did not get the benefit of prior facility knowledge, had lower performance initially and that it took several days for the group to get up to speed.

Overview for Test Two. The second Discriminant Analysis used Question 13 as the variable of interest. Survey Questions 38-44 were evaluated to determine which of the variables would most discriminate between the two groups formed by Question 13 responses. The model developed by Discriminant Analysis identified four variables and their associated discriminant coefficients. As previously discussed in Chapter Three, the absolute value of the coefficients represent the relative percentage contribution of each question to the discriminant function. Since the pecentages are relative, they do not sum to 100 percent, and the individual coefficients may even exceed 100 percent. The absolute values of the coefficients are listed in Table IX.

TABLE IX

Research Objective Three Test Two Summary

Question	Discriminant Coefficient
40	1.16
44	.81
38	.50
42	.44

As in test one, the variables were tested by classification as were the variables in test one. The capability of the variables to discriminate, according to the classification test, is correct to 81.48 percent. The high percentage is again an indication of the strength of the discriminating variables to discriminate. Careful attention should be given to the variables with regards to the advance visit and their impact on the Should Cost.

Significant Questions and Comments.

40. The advance team's size was adequate to conduct the advance team visit.

Comments. All advance team members indicated that the size of the advance teams had been adequate to conduct the advance visit. Comments strongly supported an advance team consisting of the Team Chief, subteam chiefs, and selected key players.

44. The advance visit was useful for determining the team members required to conduct the overall SC.

Comments. Most members of the advance team agreed that the advance visit was useful for selecting team members. However, some disagreement existed on the issue. One comment stated that the individual knew before the advance visit what skills and people were needed to conduct the overall effort.

38. I had adequate knowledge of the contractor's facility, operations, and on-going activities to help me prepare for the advance team visit.

Comments. No comments were made regarding the question. However, the importance of having the contractor's proposal prior to any planning effort is very important and will be discussed under Research Objective Five.

42. I received enough information from other Government agencies and the contractor to prepare for the advance visit.

Comments. Comments received with regards to the question were very limited. Research Objective Five will address availability of information from the contractor.

Research Objective Four

Research Objective Four evaluates Team Chief and Deputy Team Chief perceptions of Should Cost management authority and guidance.

Overview. Of the four Should Cost studies surveyed, 10 individuals indicated their role in the Should Cost effort

was as a Team Chief and 3 individuals indicated Deputy Team Chief. One of the 13 individuals did not answer Questions 45-47. Questions 45-47 specifically address functions performed or affected by the top management of a Should Cost effort as identified in AFP 70-5. The questions were designed to solicit the views of the top management group in the areas most affected by the group. The researchers felt that it was important to investigate the questions because of their impact on the planning process. Question means and the distribution of the responses obtained from the FREQUENCIES subprogram are included after each question. In addition, Question 9, which was used to determine the effective/ineffective groups, will be addressed in comparison to Questions 45-47.

Questions and Comments.

45. I had adequate authority in selecting personnel.

1	2	3	4	5	6	7	Mean
2	3	0	3	0	2	2	3.83

Comments. The comments indicated that most of the respondents were divided pretty evenly at opposite ends of the scale. The only two comments made support the dichotomy that existed on the issue. One comment stated that the Team Chief knew the people needed and gave team leaders the authority to get them. The other comment was strongly in the opposite direction. "No! I was given people."

Since AFP 70-5 states that the Team Chief should have

adequate authority in selecting personnel, the researchers would have expected the mean to be higher than 3.83.

46. I was able to get the people I needed on the SC team.

1	2	3	4	5	6	7	Mean
2	2	3	2	0	3	0	3.42

Comments. Most responses were on the "agree" end of the scale. The favorable responses would indicate that in most cases the Team Chiefs were able to get the people they needed. Comments favorably support the contention.

47. I was given sufficient guidance and was provided clear lines of authority in the charter.

1	2	3	4	5	6	7	Mean
5	2	1	1	1	1	1	2.83

Comments. The response to the issue of the charter was mixed. Most responses were toward the agree end; however, each of the other choices received at least one response. Even though the responses indicated some disagreement, no meaningful comments were made.

9. The Should Cost planning process proved essential for a successful on-site visit.

1	2	3	4	5	6	7	Mean
6	3	1	0	1	1	0	2.17

Comments. For purposes of analysis, nine Team Chiefs and Deputy Team Chiefs were classified in the effective group, and three were classified in the ineffective group. With a mean of only 2.17 and a

significant number of individuals in the effective group, the researchers expected the responses for Questions 45-47 to be more toward the favorable end of the scale than the results indicated. However, because of the small sample size and few respondent comments, the researchers were not able to determine meaningful relationships between Question 9 and Questions 45-47.

Research Objective Five

Research Objective Five evaluates sources of information Should Cost team members stated were most helpful in the Should Cost planning process.

Overview. Analysis of the objective was based upon the comments solicited by open-ended survey Question 48. Question 48 was included to learn what sources of information Should Cost participants felt were most useful in the planning process.

Question and Comments.

48. What sources of information were helpful in SC planning?

Comments. Many sources of information were identified as being useful; however, four sources were highlighted substantially more than any others. The four sources which appeared most helpful in the planning process were: 1) information pertaining to the contractor; 2) previous Should Cost plans and reports; 3) previous experience; and 4) AFP 70-5.

1. Information Pertaining to the Contractor. To perform an effective Should Cost, past participants felt that a thorough knowledge of the contractor was important. One approach to gain the necessary knowledge was to school the Should Cost team members in the contractor's way of doing business. The approach would encompass classes that address the equipment and technology one could expect to encounter at the contractor's facility and the way the contractor builds or develops proposals. It was suggested that the schooling be conducted by system program office personnel who work directly with the contractor of interest.

Knowledge of the contractor's history and future plans was also identified as being important. Comments indicated that team members should investigate and be familiar with past proposals, audits, and technical evaluations that could have a bearing on the Should Cost effort. Additionally, team members should be versed in the contractor's current capital investment and future automation plans. Any data available on productivity improvement should be ascertained and reviewed.

Finally, the requirement for the Should Cost must be understood by all team members. Emphasis should be placed on the proposal background, production history, and current status of the hardware item to be Should Costed.

2. Previous Should Cost Plans and Reports. Previous Should Cost plans and reports were found very useful for

planning. Comments indicated that previous Should Cost reports served as the primary source of data. Of particular importance were prior studies performed on the same contractor. The studies were reported as being crucial for formulating strategy.

3. Previous Experience. Previous experience appeared to be a major source of information for the planning effort. It was pointed out that discussions with prior Team Chiefs, subteam chiefs, worker team members, and individuals with engineering fact finding experience proved extremely useful.

4. AFP 70-5. AFP 70-5 was identified as a useful source of information. It was the information source mentioned most often in response to Question 48.

Other sources of information identified as useful by Should Cost team members included the following:

1. AFCMD publications and data.
2. The advance visit.
3. Well defined credentials of team members and potential members.
4. Information provided by the Army.

Research Objective Six

Research Objective Six evaluates the areas of Should Cost planning that team members stated as needing improvement.

Overview. Analysis of the objective was based upon the comments solicited by open-ended survey Question 49.

Question 49 was included to learn what areas of Should Cost planning needed improvement. The researchers felt that the question would draw meaningful comments from individuals for the following reasons:

1. The breadth of the area covered by the survey could serve as a memory jogger as well as open up areas not previously considered by the respondents.

2. The survey was completely anonymous.

Question and Comments.

49. Do any areas of Should Cost planning need improvement?

Comments. A great many comments were made by respondents for improving the Should Cost planning process. Overall, the comments could be generalized into four main areas: 1) personnel, 2) training, 3) planning and coordination, and 4) information sources.

1. Personnel. Several key aspects of personnel were addressed. Team members emphasized the need for qualified personnel, adequate manpower, and previous experience. Team members felt that selection of qualified personnel is very important and that planning for their selection should be improved. Qualified prospects should be identified early and should go through a screening process to ensure that the team is equipped with experts in each specialty of a Should Cost. Because of the extensive scope of planning for and conducting the Should Cost, team members stated that the number of personnel on the team should be increased. They

stressed that adequate manpower, to include competent secretarial assistance, is essential to planning.

Many respondents considered previous experience necessary for ensuring the success of the planning process. They stated that the majority of the team should consist of members with previous experience. One individual suggested that a permanent cadre of three to five experienced individuals be assigned to each team to ensure a "thread of continuity." To expand the knowledge and capabilities of the planning core, the respondents stressed increased training and familiarity with the contractor's product, facility, and organizational structure. One team member commented that if Should Costs are to become commonplace, AFSC should consider establishing a permanent Should Cost team at the command level. The permanent team would fill the void in knowledge and expertise currently lacking when a newly formed team needs assistance.

2. Training. As highlighted above, experienced people are an important element of Should Cost planning; however, the Should Cost effort cannot always get all the experienced personnel it needs. Therefore, having some form of training program for personnel was deemed necessary by team members. Suggestions ranged from simple face-to-face discussions with experienced Should Cost personnel to the establishment of formal training programs. One suggestion was to have discussions, using detailed examples, between experienced

and inexperienced Should Cost team members of the same specialty. The interaction would provide a forum for questions and answers, as well as provide valuable guidance and direction in the planning effort.

Another suggestion was to have required introductory orientation and training sessions for Should Cost team members prior to the visit. The sessions would provide the individuals with a common data base on the workings of the Should Cost and the contractor. A thorough understanding of the Should Cost and the contractor would also ensure better coordination and cooperation between team members.

Another individual suggested that each Should Cost include a number of new people as trainees who might be expected to participate in future Should Costs. The training would help ensure a valuable talent pool for the future. Finally, one respondent suggested that a continuing education course at AFIT be developed. The individual felt that attendance of the course should be a requirement before performing Should Cost duties.

3. Planning and Coordination. Should Cost team members indicated that the team must thoroughly plan and prepare themselves prior to going on-site. Since the effort requires interface with both the contractor and government agencies, planning is a must. To ensure effective planning, a comprehensive meeting to discuss all aspects of the Should Cost must be held with all team members before and after the

advance visit. The planning effort must produce a clearly defined breakdown of individual responsibilities. Planning should identify the necessary documents to obtain, who to get them from, the type of analysis to perform on the documents, and the purpose of the analysis.

Another area for suggested improvement was coordination. One team member commented that individuals should make contacts at the contractor's facility to ensure cooperation. Coordination between the Should Cost team and other government agencies including the Defense Contract Audit Agency and the Defense Contract Administration Service was also identified as being essential but somewhat lacking. The agencies can provide team support and information regarding the contractor.

4. Information Sources. Several team members felt that there was a lack of information available to properly plan. Suggestions made to alleviate the problems included improvements to AFP 70-5, increased knowledge of the contractor's proposal, and the establishment of a Should Cost data bank.

Improvements to AFP 70-5 as suggested by team members included the following: 1) updated checklist for individuals to follow; 2) simplification and more explanation of formats to be followed during planning; and 3) more examples and emphases on all parts of Should Cost planning.

Team members suggested that the team should thoroughly

study the contractor's proposal. No team member should be allowed in the contractor's facility without a thorough knowledge of the proposal. Comments indicated that it was very important to have the proposal available to all workers early in the planning phase.

Finally, respondents commented that a data bank of previous Should Cost plans and reports should be established in the form of a DOD library. At the very minimum, they felt that documents of previous Should Costs performed throughout DOD should be accessible to all team members. Such a data bank could provide valuable information to aid in the planning effort.

V. Conclusions and Recommendations

The chapter provides a brief summary of the research study, presents the conclusions based on the results obtained, and makes recommendations for future research.

Research Overview

Overview. The purpose of the study was to identify critical success factors in Should Cost planning as perceived by former Should Cost team members. Six research objectives were developed to more easily identify critical success factors. A survey was designed to gather data on team members' perceptions of various aspects of Should Cost planning. The surveys were distributed to 136 previous Should Cost team members. Response to the surveys was greater than 65 percent. The returned surveys were analyzed, and the results were presented in Chapter Four. The following sections present an overview of the Chapter Four analysis by research objective.

Research Objective One. Identify significant differences between Should Cost supervisors' and nonsupervisors' perceptions of Should Cost planning.

The t-test identified the following six questions from the survey as being significant between supervisors and nonsupervisors: Questions 8, 23, 24, 28, 29, and 30.

Research Objective Two. Identify significant

differences between the perceptions of Should Cost team members classifying planning as "effective" and those classifying planning as "ineffective."

The t-test identified the following twenty-five questions as being significant between the "effective" and "ineffective" groups: Questions 6-8, 11, 13-19, 22-30, and 33-37.

Research Objective Three. Identify a rank ordering of key discriminants of effective/ineffective Should Cost planning as determined by perceptions of Should Cost participants.

Test One used Discriminant Analysis to determine which factors of Should Cost planning most discriminate between the "effective" and "ineffective" groups. The following ten questions, in order of their discriminating capability, were identified by the analysis: Questions 2, 24, 35, 34, 17, 21, 31, 15, 20, and 10.

Test Two used Discriminant Analysis to determine which factors associated with the advance team most discriminate between the "effective" and "ineffective" groups. The following four questions, in order of their discriminating capability, were identified by the analysis: Questions 40, 44, 38, and 42.

Research Objective Four. Evaluate Team Chief and Deputy Team Chief perceptions of Should Cost management authority and guidance.

The FREQUENCIES subprogram and respondent comments were used to analyze the questions. Due to a small sample size and few respondent comments, meaningful analysis of the question was limited.

Research Objective Five. Evaluate sources of information Should Cost team members stated were the most helpful in the Should Cost planning process.

The analysis of respondents' comments indicated the following sources of information as most helpful:

1. Information pertaining to the contractor.
2. Previous Should Cost plans and reports.
3. Previous experience.
4. AFP 70-5.

Research Objective Six. Evaluate areas of Should Cost planning that team members stated as needing improvement.

The analysis of respondents' comments indicated that the following areas of Should Cost planning need improvement:

1. Personnel qualifications, manpower, and experience.
2. Training of personnel.
3. More thorough planning.
4. Information sources.

Conclusions

Overview. The six research objectives highlighted several key aspects of planning as being critical to the

success of the Should Cost. The researchers employed a five step process to determine the critical success factors.

Since Discriminant Analysis was the strongest test employed in the analysis of survey responses, the ten key discriminants determined by Test One of Research Objective Three formed the basis for the critical success factors. The following categories summarize the areas of the ten key discriminants:

1. Flexible plans (Q8).
2. AFP 70-5 (Q24).
3. Feedback (Q35).
4. Controls to monitor progress (Q34).
5. Subteam planning (Q17).
6. Team Chief rank (Q21).
7. Responsibility and authority to accomplish tasks (Q31).
8. Contractor support (Q15).
9. Previous experience (Q20).
10. Knowledge of the contractor (Q10).

The researchers then combined related categories of key discriminants. Categories 3 and 4 were combined under "feedback and control," and categories 2 and 10 were combined under "proper information sources" resulting in eight critical success factors.

Second, the researchers evaluated the significant results identified in consideration of Research Objective

One to determine relationships with the critical success factors identified through Discriminant Analysis. Most significant results from Objective One appeared related to the previously identified critical success factors and were placed into existing critical success factor categories. Questions 23, 28, and 29, pertaining to "the master schedule," "logistics support," and "availability of personnel" respectively, did not fit previously identified factors. The researchers evaluated the comments for the questions and determined that the three areas should be included as critical success factors. Question 23 was combined with "subteam planning" to become the critical success factor "attention to master schedule and subteam planning." Question 28 was combined with "contractor support" to become "contractor and logistics support."

Third, the researchers evaluated the twenty-five significant questions identified in Research Objective Two. All significant questions were placed into existing critical success factor categories except Question 13. The question pertained to "the advance team." The researchers evaluated the comments for Question 13 and determined that it should be included as a critical success factor.

Fourth, the four questions highlighted by Test Two of Research Objective Three, pertaining to advance team planning, were grouped under the "advance team" category.

Fifth, significant areas identified by Research

Objectives Five and Six were combined into existing categories except for "training of Should Cost team members" and "selection of qualified personnel." Both categories became critical success factors.

The five step process resulted in twelve critical success factors. Table X summarizes the twelve categories and lists the associated questions under each research objective.

Critical Success Factors of Should Cost Planning. Based on the analysis of the research objectives, the following critical success factors of Should Cost planning have been identified:

1. Flexible plans.
2. Proper information sources.
3. Feedback and control.
4. Availability of personnel.
5. Attention to master schedule and subteam planning.
6. Training of Should Cost team members.
7. Previous experience.
8. Team Chief rank.
9. Selection of qualified personnel.
10. Responsibility and authority to accomplish tasks.
11. Contractor and logistics support.
12. Advance team.

Flexible Plans. Flexibility of plans was identified as significant in Research Objectives One and Two

TABLE X

Critical Success Factors

	Research Objective 1	2	3	4	5	6
1. Flexible plans.	8,30	8,7 30	8			
2. Proper information sources.	24	24,37	24,10		48	49
3. Feedback and control.		11,16 25,27 34,35 36	34,35			
4. Availability of personnel.	29	29				
5. Attention to master schedule and subteam planning.	23	6,17 22,23 33	6			
6. Training of team members.						49
7. Previous experience.			20		48	49
8. Team Chief rank.			21			
9. Selection of qualified personnel.		14 19				49
10. Responsibility and authority to accomplish task.		26	31			
11. Contractor and logistics support.	28,	15,18 28	15			
12. Advance team.		13		38,40 42,44		

and as the most discriminating factor of effectiveness in Research Objective Three. The strongest comments addressed 1) the unwillingness to deviate from established plans and 2) contractor inflexibility. Should Cost teams must ensure that plans are flexible enough to respond to changes and problems during the planning process and once the team arrives on-site. A primary consideration must be to ensure that flexibility is not limited by a resistance to change plans just to enforce compliance with initial plans. As in any complex environment like a Should Cost, situations will change and problems will arise. Countering these situations will depend on the ability of the supervisor to recognize or at least accept the situation and to respond accordingly.

Proper Information Sources. Perfect information is desired by all managers, but the cost in time and personnel is prohibitive. Managers therefore are forced to make sure that the proper information is available and used for the planning effort. The research identified the following sources of information as invaluable to planning success:

1. AFP 70-5. The pamphlet provides valuable guidance for Should Cost planning and should be made available to all team members early in the planning process.

2. The contractor's proposal. Team members need to have the proposal available during planning to ensure that they are aware of the requirements of the Should Cost.

3. Information about the contractor's facility, on-going operations, and organizational structure. The information could be obtained from the AFPRO or the advance team. The information should be made available to team members prior to planning.

4. Previous Should Cost plans and reports. Accessibility to previous Should Cost plans and reports would be a valuable aid in planning. The establishment of a central data bank was identified as one means of making information available.

Feedback and Control. Team members identified a lack of feedback and control as a reason for ineffective planning. The following areas were suggested by team members to aid effective planning: 1) daily meetings with the Team Chief to chart progress and to exchange information among team members; 2) continual involvement of team leaders in monitoring plans; and 3) setting of deadlines to ensure completion of plans on time.

Availability of Personnel. Should Cost team members need to be able to devote their full attention to Should Cost planning. Team members should not have to divide their time between the Should Cost and other duties. One suggestion was to move the team to an off-site location just prior to the contractor visit so that they could devote their full attention and efforts to planning.

Attention to Master Schedule and Subteam Planning.

The research identified the development of the master schedule and attention to subteam planning as critical to Should Cost planning. Effective planners identified the master schedule as the key to successfully scheduling team member participation. In addition, team members commented that good subteam planning was invaluable in developing individual plans and for providing insight into the functions of other team members.

Training of Should Cost Team Members. The research identified the need to establish a training program to improve the quality of planning. The following three suggestions were offered: 1) organized discussions between experienced and inexperienced team members of like specialties to exchange ideas and answer questions; 2) an introductory orientation and training session for all team members to provide information on the workings of the Should Cost and the contractor; and 3) a formal Should Cost training course conducted by AFIT to provide necessary training prior to beginning the Should Cost planning.

Previous Experience. The research identified previous experience as a critical element for planning. Team members commented that previous experience, especially at the Team Chief and Deputy Team Chief level, is essential. Previous experience will provide the necessary insight that individuals must possess to plan effectively.

Team Chief Rank. The research determined that for

effective planning the Team Chief's rank should be at least a Colonel or GS-15 as specified in AFP 70-5. Being a Colonel/GS-15 or higher enables the Team Chief to better 1) ensure that they can get the people they need and 2) obtain necessary assistance from support agencies and the contractor.

Selection of Qualified Personnel. An individual's qualifications should be evaluated prior to inclusion on the Should Cost team. Qualifications should be determined through a screening process. As a minimum, the screening process should ensure the team is equipped with an expert in each specialty.

Responsibility and Authority to Accomplish Tasks. The research identified responsibility and authority as one of the major considerations for planning success. Effective team members cited the delegation of authority and responsibility for task accomplishment, as the primary reason for planning success. In addition to authority and responsibility, visible Team Chief support of subordinate decisions was an essential corollary to planning success. Essentially, individuals performed more capably when allowed to function in an environment consisting of an effective mix between visible support, responsibility, and authority.

Contractor and Logistics Support. The research identified a lack of adequate contractor and logistics support. Comments throughout the research indicated that

planning was hampered by lack of contractor support. Many comments indicated that the contractor was slow to provide requested information. Team members attributed the lack of support to the perceived adversarial role that exists between Government and contractor personnel. Team members also stated that planning was hampered by a lack of logistics support. Specifically, team members mentioned reoccurring problems with lodging and transportation. Team members stated that logistics considerations are as important as the mission objectives.

Advance Team. The effective group strongly supported the use of the advance team. According to team members, the advance team should be comprised of the Team Chief and other key team members. Team members pointed out that the advance team visit served three important purposes: 1) helped resolve communication problems between the Government and contractor; 2) ensured that the contractor had the necessary data available for the full team visit; and 3) provided key team members with a knowledge of the contractor's facility and operations.

Recommendations for Future Research

The following is a list of recommendations for future research.

1. The research effort looked at only planning efforts within the Air Force. A similar study could be conducted to

analyze Should Cost planning methods in other DOD agencies. Of particular interest might be a similar study investigating Army planning methods since the Army has conducted far more Should Cost studies than any other service. Such an effort may discover additional methods and techniques that could be used to benefit Air Force Should Cost planning.

2. The Air Force is significantly increasing the number of Should Costs it performs. A follow-up study that addresses the future Should Cost efforts would be beneficial. Future studies might reveal different perceptions with respect to effective planning methods and could be used to increase the data base of the current study.

3. A recent study by Conway and Howenstein (1983) attempted to analyze the costs and benefits of Should Cost. However, the researchers were limited by the small number of recent Air Force Should Costs. With the increase in the number of Air Force Should Costs, future research could provide a more meaningful evaluation of cost versus benefits.

4. The current research effort identified the need for establishing a Should Cost data bank. A study could be conducted to determine where such a data bank should be located, what type of data would be most useful, and how the data would be input and accessed.

5. The need to properly train Should Cost team members was identified in the study. A future effort could evaluate team member requirements to determine a training program that would be most effective in terms of costs and benefits. One possiblility would be to develop a course curriculum at AFIT to train Should Cost team members.

6. Team Chiefs and Deputy Team Chiefs are critical to the success of the Should Cost. The questionnaire method used in the research effort did not provide indepth information from these individuals with regard to their particular planning activities. Future research should consider conducting personal interviews with Team Chiefs and Deputy Team Chiefs to get a better understanding of their planning roles.

Appendix A: Should Cost Questionnaire

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS AERONAUTICAL SYSTEMS DIVISION (AFSC)
WRIGHT-PATTERSON AIR FORCE BASE, OHIO 45433

REPLY TO
ATTN OF:

SUBJECT: Survey of Air Force Should Cost Planning

TO: Survey Participants

1. I am sponsoring a survey evaluating the effectiveness of Should Cost planning. Captain Heitman and Captain King of the Air Force Institute of Technology are conducting this research effort to help us gather information about your attitudes, feelings, and perceptions of Should Cost planning.

2. As an expert in Should Cost, you should find this questionnaire interesting, easy to answer, and relevant to your position. Participation in the survey is strictly voluntary. All your answers are confidential and will be used only for aggregate statistical analysis.

3. Please return the completed survey at your earliest convenience in the enclosed reply envelope. A report of findings of this research will be made available to my office at the completion of the study. Thank you for your participation.

MICHAEL F. GOLDSTEIN, Lt Colonel, USAF
Director of Pricing
Deputy of Contracting and Manufacturing

2 Atch
1. Should Cost Survey
2. Return Envelope

DEPARTMENT OF THE AIR FORCE
AIR FORCE INSTITUTE OF TECHNOLOGY (AU)
WRIGHT-PATTERSON AIR FORCE BASE, OH 45433

REPLY TO ATTN OF: AFIT/LSQ(Capt King) 6 Apr 1984

SUBJECT: Survey of Air Force Should Cost Planning

TO: Survey Participants

1. I am involved in an AFIT thesis evaluating the effectiveness of Should Cost planning. Colonel David Krahenbuhl, Deputy for Contracting and Manufacturing at Armaments Division, is sponsoring this study to help us gather information about your attitudes, feelings, and perceptions of Should Cost planning.

2. As an expert in Should Cost, you should find this questionnaire interesting, easy to answer, and relevant to your position. Participation in the survey is strictly voluntary. All your answers are confidential and will be used for aggregate statistical analysis.

3. Please return the completed survey at your earliest convenience in the enclosed reply envelope. A report of findings of this research will be made available to Colonel Krahenbuhl at the completion of the study. Thank you for your participation.

Teddy King

TED KING, Captain, USAF
Researcher, AFIT

2 Atch
1. Should Cost Survey
2. Return Envelope

PRIVACY STATEMENT

In accordance with paragraph 8, AFR 12-35, the following information is provided as required by the Privacy Act of 1974:

a. Authority:

(1) 5 U.S.C. 301, Departmental Regulations, and/or

(2) 10 U.S.C. 8012, Secretary of the Air Force, Powers, Duties, Delegation by Compensation; and/or

(3) DOD Instruction 1100.13, 17 Apr 68, Surveys of Department of Defense Personnel; and/or

(4) AFR 30-23, 22 Sep 76, Air Force Personnel Survey Program.

b. Principal purposes. The survey is being conducted to collect information to be used in research aimed at illuminating and providing inputs to the solution of problems of interest to the Air Force and/or DOD.

c. Routine Uses. The survey data will be converted to information for use in research of management related problems. Results of the research, based on the data provided, will be included in written master's theses and may also be included in published articles, reports, or texts. Distribution of the results of the research, based on the survey data, whether in written form or presented orally, will be unlimited.

d. Participation in this survey is entirely voluntary.

e. No adverse action of any kind may be taken against any individual who elects not to participate in any or all of this survey.

FOR QUESTIONS 1-3, PLEASE CIRCLE THE APPROPRIATE NUMBER.

1. My role in the Should Cost effort was:
   1. Team Chief 2. Deputy Team Chief 3. Operations Officer
   4. Subteam Leader 5. Team Worker 6. Other (explain) _____

2. During the Should Cost, I was:
   1. Military 2. Government employee 3. Civilian consultant 4. Other (explain) _____

3. How were you selected for the Should Cost:
   1. Volunteer 2. Supervisor 3. Team Chief 4. Computer 5. Other (explain) _____

FOR THE FOLLOWING QUESTIONS, PLEASE CIRCLE ONE OF THE NUMBERS 1 THRU 7.
BASE YOUR CHOICE ON THE FOLLOWING SCALE:

1	2	3	4	5	6	7
Strongly Agree			Neutral			Strongly Disagree

4. I had adequate knowledge of the contractor's proposal in drawing up my plans. 1 2 3 4 5 6 7
   Comments:

5. The contractor was adequately prepared for our Should Cost (SC) visit. 1 2 3 4 5 6 7
   Comments:

6. Detailed plans were a necessity for an effective SC. 1 2 3 4 5 6 7
   Comments:

7. We followed the plans we developed. 1 2 3 4 5 6 7
   Comments:

8. The SC plans had enough flexibility to allow for changes and problems. 1 2 3 4 5 6 7
   Comments:

9. The Should Cost planning process proved essential for a successful on-site visit. 1 2 3 4 5 6 7
   Comments:

10. I had knowledge of the contractor's facility, operations, and on-going activities to help me in planning. 1 2 3 4 5 6 7
    Comments:

11. Good coordination and lines of communication existed with the government team during planning. 1 2 3 4 5 6 7
    Comments:

12. The use of civilian consultants would be a valuable addition to the SC planning effort. 1 2 3 4 5 6 7
    Comments:

BASE YOUR CHOICE ON THE FOLLOWING SCALE:

1 Strongly Agree 2 3 4 Neutral 5 6 7 Strongly Disagree

13. An advance team visit is necessary to enhance SC planning. 1 2 3 4 5 6 7
Comments:

14. Team composition was adequate to conduct the SC planning effort. 1 2 3 4 5 6 7
Comments:

15. The contractor was familiar with our purpose and provided adequate support. 1 2 3 4 5 6 7
Comments:

16. The SC team did not meet often enough to ensure proper planning and coordination. 1 2 3 4 5 6 7
Comments:

17. Subteam planning efforts were useful in developing the individual plans. 1 2 3 4 5 6 7
Comments:

18. A good relationship existed between the government and the contractor. 1 2 3 4 5 6 7
Comments:

19. Individual team members had adequate knowledge and skills to accomplish the task. 1 2 3 4 5 6 7
Comments:

20. Previous SC experience is essential to a successful SC effort. 1 2 3 4 5 6 7
Comments:

21. The team chief should be a colonel/GS-15 or higher. 1 2 3 4 5 6 7
Comments:

22. The master schedule was clearly designed and available to all team members early in the planning. 1 2 3 4 5 6 7
Comments:

23. The master schedule was useful in helping prepare detailed plans. 1 2 3 4 5 6 7
Comments:

24. AFP 70-5, Should Cost, provided valuable guidance for SC planning. 1 2 3 4 5 6 7
Comments:

BASE YOUR CHOICE ON THE FOLLOWING SCALE:

1	2	3	4	5	6	7
Strongly Agree			Neutral			Strongly Disagree

25. The organizational structure allowed for effective and efficient accomplishment of the planning. 1 2 3 4 5 6 7
Comments:

26. My specific task was adequately defined. 1 2 3 4 5 6 7
Comments:

27. I received adequate management guidance in conducting my planning efforts. 1 2 3 4 5 6 7
Comments:

28. Logistics support considerations for the facility visit were adequately addressed during planning. 1 2 3 4 5 6 7
Comments:

29. I was able to dedicate my full time to the SC planning. 1 2 3 4 5 6 7
Comments:

30. The planning documents I prepared proved effective during the on-site visit. 1 2 3 4 5 6 7
Comments:

31. I was given full responsibility and authority to accomplish my task. 1 2 3 4 5 6 7
Comments:

32. It is necessary for the entire SC team to be brought together for an orientation seminar prior to the facility visit. 1 2 3 4 5 6 7
Comments:

33. I was given sufficient time to develop my plans. 1 2 3 4 5 6 7
Comments:

34. There were controls to monitor the progress and accomplishment of plans. 1 2 3 4 5 6 7
Comments:

35. I was provided sufficient feedback on my plans. 1 2 3 4 5 6 7
Comments:

BASE YOUR CHOICE ON THE FOLLOWING SCALE:

1	2	3	4	5	6	7
Strongly Agree			Neutral			Strongly Disagree

36. Feedback was useful in improving my plans. 1 2 3 4 5 6 7
    Comments:

37. A common data bank of SC information should be available for planning efforts. 1 2 3 4 5 6 7
    Comments:

IF YOU WERE A MEMBER OF THE ADVANCE TEAM, PLEASE ANSWER QUESTIONS 38 THRU 44.

38. I had adequate knowledge of the contractor's proposal in preparing for the advance team visit. 1 2 3 4 5 6 7
Comments:

39. I had adequate knowledge of the contractor's facility, operations, and on-going activities to help me prepare for the advance team visit. 1 2 3 4 5 6 7
Comments:

40. The advance team's size was adequate to conduct the advance team visit. 1 2 3 4 5 6 7
Comments:

41. Individual advance team members had adequate knowledge and skills to accomplish the advance visit. 1 2 3 4 5 6 7
Comments:

42. I received enough information from other Government agencies and the contractor to prepare for the advance visit. 1 2 3 4 5 6 7
Comments:

43. The advance visit was useful in determining specific areas that needed detailed analysis. 1 2 3 4 5 6 7
Comments:

44. The advance visit was useful for determining the team members required to conduct the overall SC. 1 2 3 4 5 6 7
Comments:

BASE YOUR CHOICE ON THE FOLLOWING SCALE:

1	2	3	4	5	6	7
Strongly Agree			Neutral			Strongly Disagree

IF YOU WERE THE TEAM CHIEF OR DEPUTY TEAM CHIEF, PLEASE ANSWER QUESTIONS 45 THRU 47.

45. I had adequate authority in selecting personnel.
    Comments: 1 2 3 4 5 6 7

46. I was able to get the people I needed on the SC team.
    Comments: 1 2 3 4 5 6 7

47. I was given sufficient guidance and was provided clear lines of authority in the charter. 1 2 3 4 5 6 7
    Comments:

THE FOLLOWING SECTION CONTAINS TWO OPEN-ENDED QUESTIONS. PLEASE MAKE COMMENTS IN THE SPACE PROVIDED

48. What sources of information were helpful in SC planning?
    Comments:

49. Do any areas of Should Cost planning need improvement?
    Comments:

THANK YOU FOR YOUR COOPERATION.

Appendix B: Respondent Comments

Effective Supervisors
Questions 4-37

4. I had adequate knowledge of the contractor's proposal in drawing up my plans.

I had just left WPAB and believe I had an advantage over many of the team members.

We had to make inquiries in most areas of his proposal.

Updated proposal was unavailable.

5. The contractor was adequately prepared for our Should Cost (SC) visit.

Depends on your point of view: Kr (contractor) was prepared to resist.

Very little real cooperation.

We had to generate most of the data from each work element.

6. Detailed plans were a necessity for an effective SC.

I would say general plans were necessity.

Strong leadership must be established early!

It makes it clearer for the team to evaluate the proposal.

7. We followed the plans we developed.

Some changes were necessary.

8. The SC plans had enough flexibility to allow for changes and problems.

A lot depends on the Kr's cooperativeness.

We were able to proceed in a direction agreed to by the team members.

9. The Should Cost planning process proved essential for a successful on-site visit.

The contractor should be made aware of the procedures and purpose of a SC team.

10. I had knowledge of the contractor's facility, operations, and on-going activities to help me in planning.

I had no prior knowledge except what was provided in the proposal, brochure, etc., related to SC.

Participated in advance team visit.

Visited plant before planning began.

Prior to visiting this facility, I had never been involved with this item or contractor.

11. Good coordination and lines of communication existed with the government team during planning.

Contact 2 to 3 times weekly with subteam chiefs during planning.

I was one of five outsiders on a 30+ SC team.

Some problems but nothing major.

12. The use of civilian consultants would be a valuable addition to the SC planning effort.

This would be a last resort if we couldn't find anyone qualified within the government.

The contractor may be even more reluctant to open up to an outside contractor.

Govt employees are short on time to devote, whereas consultants have full time as long as needed.

Keep it a govt effort.

I would rather the word was could.

We used them--no question about value, they bring a good background of non-defense experience. Hence--a fresh perspective.

On my particular SC effort the Air Force had provided all the means for sufficient data collection.

Not during planning. Use of consultants is getting out-of-hand. The govt should control evaluations and have the "corporate memory" for Should Cost. Perhaps a separate

organization should be set-up with enough manning and talent to do the job.

13. An advance team visit is necessary to enhance SC planning.

Essential!

To enable the contractor to prepare and have the necessary back up data available.

14. Team composition was adequate to conduct the SC planning effort.

Generally, small cadre should do long range planning to establish the SC team skeleton, then the entire team.

It's difficult to get the best people and without the best the SC is less than optimal.

Planning done by subteam chiefs and me.

15. The contractor was familiar with our purpose and provided adequate support.

These are two questions which require two answers: familiar with purpose--yes; adequate support--no.

Stalling tactics prevailed.

Completely familiar with purpose. Barely adequate in some areas of support.

However not regarding productivity and the Booz, Allen, Hamilton studies.

Army had just completed a SC on one of their programs with the contractor.

"Stone wall" if they can.

The support was there but we had to retrieve alot of it ourselves.

16. The SC team did not meet often enough to ensure proper planning and coordination.

Daily meetings were absolutely essential to maintain communication and team enthusiasm.

We were together most of the day and had wrap up meetings

every night.

Not frequently.

17. Subteam planning efforts were useful in developing the individual plans.

They were mandatory!

It provided extra insight to what other members were doing.

18. A good relationship existed between the government and the contractor.

As good as possible (considering) an adversary role.

As well as could be expected.

Good at first, then turned to tense.

At times I felt that contractor was not willing to provide answers to all the questions.

Hard feelings at times.

19. Individual team members had adequate knowledge and skills to accomplish the task.

A few were new to doing this.

One or two weak team members had to be carried by others.

It was the first SC team for alot of its members.

20. Previous SC experience is essential to a successful SC effort.

Preferably the Team Chief, but if the TC does not have this experience, then his closest cadre should have the experience.

Should have SC trainees assigned to team.

Not essential but extremely helpful.

Not essential for all team members--but some members should be experienced.

There must be some prior experience but not necessary for all personnel.

Depends on experience of participants.

Mandatory subteam chief level if not SC other types of pre-negotiation analysis.

It certainly helps to have members that have been on a team in the past.

Sound knowledge of costing is essential.

21. The team chief should be a colonel/GS-15 or higher.

Depends on the size of the proposal and expertise of the lower grade.

Team chief must be very strong and have support from above.

I agree to the extent that rank or grade is an indicator of government support of the effort. A lower rank would be just as adequate if govt support clearly established initially. Depends a lot on TC personality and drive.

The team chief must have the clout to deal with the contractor.

This is needed to get the necessary attention from the contractors.

Yes--to carry proper weight with contractor.

LTC or full.

Overall SC chiefs should be Gen off or SES. Individual teams (eg., manuf, pricing,. . .) LtCol or GS-14.

Higher is essential.

It makes it easy to deal with the management of the contractor.

Needs authority.

22. The master schedule was clearly designed and available to all team members early in the planning.

More detail in negotiation stage is needed.

23. The master schedule was useful in helping prepare detailed plans.

Can't do without it when scheduling part-time participation.

Detail planning went into the master schedule.

24. AFP 70-5, Should Cost, provided valuable guidance for SC planning.

One of the finest AF pamphlets written.

Good manual.

Has some shortcomings.

25. The organizational structure allowed for effective and efficient accomplishment of the planning.

Organization should be compatible with proposal and contractor's organization.

26. My specific task was adequately defined.

Part was; part was flexible.

My team members were briefed on their responsibilities.

27. I received adequate management guidance in conducting my planning efforts.

Within limits that only a few of us had done true "should cost."

Used 70-5 and past experience.

28. Logistics support considerations for the facility visit were adequately addressed during planning.

Work environment, people comforts and non-duty hour activities as important as the mission objectives.

29. I was able to dedicate my full time to the SC planning.

Yes--because of my position (worked as consultant).

I had to continue my normal activities concurrently.

Many interruptions.

30. The planning documents I prepared proved effective during the on-site visit.

31. I was given full responsibility and authority to accomplish my task.

What I wasn't given or was forgotten, I took.

The team chief backed us up on all our decisions.

Except for control of consultants.

32. It is necessary for the entire SC team to be brought together for an orientation seminar prior to the facility visit.

I feel very strongly on this point (gave it a 1).

Can be done the first day on-site.

This is more "pie in the sky" than practiced.

I agree.

Probably a good idea.

33. I was given sufficient time to develop my plans.

34. There were controls to monitor the progress and accomplishment of plans.

Too many variables.

Yes--deadline dates.

Daily team meetings involved entire on-site staff.

Frequent meetings and personal interchange.

35. I was provided sufficient feedback on my plans.

It was my responsibility to ensure workable planning was developed.

I was not informed of the results of my on-site effort.

36. Feedback was useful in improving my plans.

My planning was totally accepted.

37. A common data bank of SC information should be made available for planning efforts.

Would help if it is available.

Would be useful as a guide.

Every SC effort is not the same but this data would be good for first time members.

For government (not consultants).

Effective Supervisors
Questions 48 and 49

48. What sources of information were helpful in SC planning?

Experience of sub-team chiefs and myself--other should costs--the manual--close working relationship with program manager to get in tune with programmatics and political issues that might need consideration (budget, etc.).

Proposal/WBS. Personal experience.

Proposal. Contractor layouts/org charts. System description. Program status. Schedule.

AFP 70-5. Data from other SCs. Previous SC team chiefs.

Experience of people who participated in previous should costs.

AFP 70-5 and discussion with personnel with a lot should cost experience.

The Air Force Pamphlet 70-5. Talking with personnel who had SC experience. Reviewing related SCs.

AFP 70-5. Also previous SC planning and schedules.

Prior knowledge of SC and contractor's proposal.

Discussion with others. Example of plans previously used.

AFP 70-5 and the milestone plans provided from previous should costs.

Prior should cost study reports, especially those done regarding the same contractor are crucial in formulating strategy.

Previously conducted should cost documents and interviews with the team members.

SPO expertise. Previous SC personnel briefings at orientation. AFP 70-5.

AFCMD publications. Contractor accounting system.

AFP 70-5. Past experience in running fact finding and should cost engineering teams.

AFP 78-5 and the results of previous should cost findings and lessons learned.

AFSC and HQAF were useless. The Army provided much.

Advance visit, contractor's proposal, other SC team members.

Quality and sources of proposal support data. Traceability of the contractor's proposal and support data. Well defined credentials of team members and potential members.

Prior should cost and knowledge of both contractor techniques/facilities and prior contracting history.

49. Do any areas of Should Cost planning need improvement?

1) We need some kind of clearer, objective method of predicting the required number of engineering man-hours for a program entering production. 2) We need a permanent cadre of 3-5 experienced, trained individuals to maintain a thread of continuity. 3) A substantial amount of information is obtained through interviews, especially in the organization and management areas. I believe this is an area where specific training might pay off. I understand that LMDC has a training course to teach interview techniques to their consultants. If so, an adaptation of this course might be useful to SC.

Introductory training/orientation sessions should be required with a checklist type guide available to provide the team a common data base on the system and contractor to be reviewed.

It would probably be wise to have both DCAS and AFLC people participate in the planning and the actual effort. Planning might also be appropriate for joint government/contractor reviews of specified subcontractors.

The manufacturing teams task is an absolute mind and body smasher. Far too much area to cover in time allocated. It is really unreasonable. Needed much larger team. I got back to my regular job totally drained and my boss was ticked because I was away so long. I never did get on sound footing again. A fine reward for playing instrumental role that saved USAF over $20 million reducing cost of contract by 25+%.

Releasing the best people for the required time.

Personnel resources. AFSC should costs place a heavy burden on the buying activity staff. A considerable amount of

uncompensated overtime is performed by those assigned to the should cost review and by those left in the buying organization to perform the workload of those assigned to the should cost review. If should costs are to become common place then AFSC should consider establishing a should cost team at the command level.

Getting consultants cleared ahead of time. Having experienced govt team and subteam leaders.

More definitive direction as to should cost requirements.

Better data bank of previous experience. Detail legal wording of IR's. Better understanding by contractor of his responsibilities to SC effort.

A talent bank should be established.

Prior planning on the part of large subteams must specify clear individual responsibilities. Each team member must also realize that all of their final results must break down into dollars and cents.

Team responsibilities after completion of SC (i.e., support of negotiations, etc.) should be detailed. Format for info used by purchaser (and his overall requirements) should be product of SC for ease of negotiation.

Team study contractor proposal. No team member should be in contractor facility without a thorough knowledge of the proposal.

The availability of previous SC plans and reports should be enhanced either by establishment of a DOD library or at least a listing of SC's performed throughout DOD.

Can't do too much planning.

Appoint team chief early. Select qualified team members early.

People commitment. Pricing models w/ computers. Contractor commitment to supply information. Plant access.

The contractor should be aware of each work area to be analyzed and the type of data needed to support their proposal.

Manual needs to emphasize other parts of a proposal other than recurring manufacturing that should be addressed particularly when short on manufacturing experience.

Noneffective Supervisors
Questions 4-37

4. I had adequate knowledge of the contractor's proposal in drawing up my plans.

5. The contractor was adequately prepared for our Should Cost (SC) visit.

6. Detailed plans were a necessity for an effective SC.

Flexibility is absolutely essential; not severely constrained or restricted planning absolutes.

7. We followed the plans we developed.

Where possible.

8. The SC plans had enough flexibility to allow for changes and problems.

9. The Should Cost planning process proved essential for a successful on-site visit.

Plans were basically only used as general guides.

10. I had knowledge of the contractor's facility, operations, and on-going activities to help me in planning.

11. Good coordination and lines of communication existed with the government team during planning.

On the contrary, I didn't know anyone on the other teams.

12. The use of civilian consultants would be a valuable addition to the SC planning effort.

Why?

13. An advance team visit is necessary to enhance SC planning.

Not from my perspective. Just allow an extra day for the team when it first arrives.

14. Team composition was adequate to conduct the SC planning effort.

15. The contractor was familiar with our purpose and provided adequate support.

16. The SC team did not meet often enough to ensure proper planning and coordination.

17. Subteam planning efforts were useful in developing the individual plans.

18. A good relationship existed between the government and the contractor.

19. Individual team members had adequate knowledge and skills to accomplish the task.

20. Previous SC experience is essential to a successful SC effort.

21. The team chief should be a colonel/GS-15 or higher.

If the person can do the job, rank is only secondary.

22. The master schedule was clearly designed and available to all team members early in the planning.

23. The master schedule was useful in helping prepare detailed plans.

24. AFP 70-5, *Should Cost*, provided valuable guidance for SC planning.

25. The organizational structure allowed for effective and efficient accomplishment of the planning.

26. My specific task was adequately defined.

27. I received adequate management guidance in conducting my planning efforts.

No guidance in particular area to be covered.

28. Logistics support considerations for the facility visit were adequately addressed during planning.

29. I was able to dedicate my full time to the SC planning.

30. The planning documents I prepared proved effective during the on-site visit.

31. I was given full responsibility and authority to accomplish my task.

Not with regard to manpower needed.

32. It is necessary for the entire SC team to be brought together for an orientation seminar prior to the facility visit.

Good idea.

33. I was given sufficient time to develop my plans.

34. There were controls to monitor the progress and accomplishment of plans.

Only generalized management meetings with overall plans. Specific individual plans were controlled by me.

35. I was provided sufficient feedback on my plans.

To the best of my knowledge, plans were submitted and filed!

36. Feedback was useful in improving my plans.

No feedback.

37. A common data bank of SC information should be made available for planning efforts.

Noneffective Supervisors
Questions 48 and 49

48. What sources of information were helpful in SC planning?

Another person I knew who had been on a previous SC.

AFP 70-5.

Field Audit Report on Contractor's proposal. The Production History and Current Status on the Hardware Item we were should costing.

What type procurement strategy (sole source or competitive) was used on current proposal or contract. Contractor's experience in producing similar type hardware. Their production experience.

AFP 70-5. Prior should cost plans. Company suggestion and comments and restraints.

Proposals, past audits, and technical evaluations.

49. Do any areas of Should Cost planning need improvement?

Formats in AFP 70-5 are too complex. Simplify!

Need adequate time, dedicated people, clear knowledge of company and processes--planning must start with preparing the RFP so the right information comes in as part of the proposal. Company must be told early of SC team requirements for reviews and meetings.

No team member should be hesitant in thoroughly interrogating contractor's employees--after all we are the customer. However be attentive and a good listener to his answers. Document facts as you find them out. On logic or judgement conclusions explain in a clear concise justification why you believe as you do.

Absolutely! Coordinated planning efforts between pricing, engineering, and logistics.

Effective Nonsupervisors
Questions 4-37

4. I had adequate knowledge of the contractor's proposal in drawing up my plans.

The last should cost study I was on spent one week prior to visiting contractor plant reviewing the proposal.

Availability of contractor's responses on time was a serious problem.

I had been working as the GBU-15 manufacturing manager for 9 years.

Proposals were provided in advance and the date of involvement was established as one week prior to arrival at the contractor's facility to allow familiarization with proposal.

Had a week to review.

5. The contractor was adequately prepared for our Should Cost (SC) visit.

Prepared nice working area, IR's were slow.

Provided and explained related data. However, think contractor remains on defensive.

The contractor had not properly briefed his workforce.

Yes, they knew we were coming. Attitudes of cooperation, though were not.

Physical location prepared.

Strategy for handling AF team established.

Insufficient personnel to react to team. Therefore, tended to delay team in accomplishing effort.

6. Detailed plans were a necessity for an effective SC.

Could have done it in 3 days.

7. We followed the plans we developed.

We had begun our analysis at WPAFB before the should cost began and followed through with our plan.

Plans had to change in many areas to adapt to the various skill levels as well as the contractor's way of doing business.

Plans were sometimes discarded for necessity. More research was needed in another area of evaluation.

Yes--in spite of contractor hinderance.

8. The SC plans had enough flexibility to allow for changes and problems.

Suggest optionals on data to ensure total application visibility i.e., other SC program.

9. The Should Cost planning process proved essential for a successful on-site visit.

10. I had knowledge of the contractor's facility, operations, and on-going activities to help me in planning.

First time was at the site.

This did not adversely impact my planning.

Needed more detail of contractor's operations in my particular area.

Team leaders did--was not really conveyed to team members.

11. Good coordination and lines of communication existed with the government team during planning.

12. The use of civilian consultants would be a valuable addition to the SC planning effort.

The government teams seemed to be adequate.

Only in specialized areas.

Providing the consultant had in depth "hands on" experience in a specific field. A textbook expert would be of no value.

Would be detrimental.

13. An advance team visit is necessary to enhance SC planning.

It would depend on the situation. When people involved have

sufficient knowledge of the contractor and the areas of evaluation it isn't necessary.

Yes, for team chiefs and leaders.

14. Team composition was adequate to conduct the SC planning effort.

Feel additional AF personnel and ALC participation would have been helpful.

15. The contractor was familiar with our purpose and provided adequate support.

Info requests were slow.

Contractor was reluctant and slow in providing data.

Contractor was very familiar with purpose but was slow to respond.

This is a yes and no situation. The contractor was familiar with our purpose but we had difficulty in getting adequate support.

Support was sometimes lacking.

Were familar but attempted to sand-bag originally; but, this changed when the team leader intervened--forcefully.

Did not have adequate personnel to handle all team members. Responses were delayed by as much as two weeks going through one person.

16. The SC team did not meet often enough to ensure proper planning and coordination.

Off-site meetings would be best for that week preceding the SC. This removes us completely from our jobs.

17. Subteam planning efforts were useful in developing the individual plans.

On my team, individual assignments never given.

18. A good relationship existed between the government and the contractor.

Both sides felt it was an adversarial relationship.

Often the attitude of the contractor was resentment. We

were in the way of their normal business activity.

General attitude appeared to be delay.

19. Individual team members had adequate knowledge and skills to accomplish the task.

Some did and some did not.

Need experts not just warm bodies.

20. Previous SC experience is essential to a successful SC effort.

At higher levels, this is true (i.e., team chief).

Mainly for should cost personnel in management positions.

It helps.

This is a relatively new field which lacks SC experience baseline.

Knowing what to expect is vital, especially for a junior officer. Consider the first time an individual serves as part of an SSEB. Very similar situation.

At least part of the team should have prior experience.

For team chief and sub team leaders.

21. The team chief should be a colonel/GS-15 or higher.

Requires a strong personality in what is obviously an adversary situation.

He should be technically oriented, not contracting oriented.

22. The master schedule was clearly designed and available to all team members early in the planning.

23. The master schedule was useful in helping prepare detailed plans.

24. AFP 70-5, Should Cost, provided valuable guidance for SC planning.

DLA team members were not provided AFP 70-5 prior to arrival at contractor plant.

What is AFP 70-5?

This value is yet to be evaluated for actual results ($).

It is good general guidance however you must tailor it to fit the program you are working.

Experience helps more.

25. The organizational structure allowed for effective and efficient accomplishment of the planning.

26. My specific task was adequately defined.

Problem of subteam chief, not fault of SC team chief.

I had very limited knowledge of my task. However, I did have very expert guidance by another team member.

27. I received adequate management guidance in conducting my planning efforts.

Two daily briefings kept team updated on progress/problems.

I was thrown into an unfamiliar area and checked on sporadically. Books just can't replace experience.

28. Logistics support considerations for the facility visit were adequately addressed during planning.

Not enough funding for sufficient rental cars.

All logistics planning was excellent.

Generally difficult to do. Have to be flexible.

29. I was able to dedicate my full time to the SC planning.

Once I arrived at site, I was 100% into my job.

No one who is working a program can dedicate full time to SC planning--you can't let other work go!

Due to the close proximity of work office to the planning area, I was not able to dedicate my full time.

30. The planning documents I prepared proved effective during the on-site visit.

I responded to other member's needs as they arose.

Lack of knowledge of the facility caused minor problems.

Needed more knowledge of contractor management and set-up.

31. I was given full responsibility and authority to accomplish my task.

I assisted someone else who reported to subteam chief.

Yes, but not all team members should have been. Lacked experience and skill.

32. It is necessary for the entire SC team to be brought together for an orientation seminar prior to the facility visit.

Impossible for a large team from numerous agencies.

An on-site orientation such as the one we had should be considered adequate.

33. I was given sufficient time to develop my plans.

First time, I developed learning curve theory on the fly; second time I had it available.

34. There were controls to monitor the progress and accomplishment of plans.

Our team chief had daily meetings to chart our progress and was very effective.

The team chiefs did an excellent job of monitoring the progress of all sub-teams.

35. I was provided sufficient feedback on my plans.

During briefings, action course was tracked.

36. Feedback was useful in improving my plans.

37. A common data bank of SC information should be made available for planning efforts.

Data bank need and contents are unclear.

Data bank must be product oriented to be effective (i.e., aircraft engines vs. wheelbarrows).

Such a data bank would be useful if it is kept current.

Team chiefs could provide summary of problem areas and favorable items.

Effective Nonsupervisors
Questions 48 and 49

48. What sources of information were helpful in SC planning?

Organizational charts of company and government counterparts.

AFP 70-5 and previous SC reports.

Team leader guidance/proposed strategy. Proposal. RFP. AFP 70-5.

Subteam support plans. Contractor's proposal.

AFP 70-5 was useful as were historical records of past should cost reviews in my office. AFCMD was helpful in that their data base includes many contractors and threshold values of measurement were available from them. My specific office handles technical evaluation of cost proposals using many should cost techniques.

Contractors capital investment and automation plans. Data on any productivity improvement programs.

Calculator, statistical handbook, notes on learning curve theory.

DID's. T.O.'s. Special processes and use of precious metals.

Previous SC reports.

The effective means of doing a SC is to have the most knowledgable personnel in a SPO explain the contractor's way of doing business, how his proposals are built, what equipment he uses, etc. We did this and I feel this was more beneficial to the team than anything else.

Copies of previous SC reports were the primary source of data provided.

AFP 70-5, prior should cost studies, discussions with advance team members, resident DCAS/DCAA office, proposal, RFP.

AFP 70-5, previous Should Cost report, information from the advance team.

Information from personnel who were intimately familiar with the contractor's operations.

Experience of others but basically we were on our own.

Contractor internal acctg and organization manuals.

Contract drawings and specs. Manufacturing process specs.

Proposal. AFPRO. DCASMA input. CMSEP. C/SCSC.

Prior SC documentation and AFP 70-5 provided guidance for SC planning. On the SC I was a part of the general plan was well laid out and presented through briefings with slides and handouts.

(Having supervisors) in touch with me sufficiently to make my duties abundantly clear. Very good cooperation.

49. Do any areas of Should Cost planning need improvement?

A definite need exists for competent secretarial assistance during Should Cost planning.

In the area of management review, the AFP 70-5 could use updating with regards to the checklists provided.

Need to have proposals available to workers prior to travel.

Face-to-face discussion of details and examples with an experienced SC person who worked on the same level (i.e., team member) and in same area (i.e., material) would have helped.

I worked in the quality portion of the SC effort and while I felt that I was effective for my part, I feel I could have been more effective with more guidance in the quality area of SC surveys.

People planning should be improved, somehow in the selection process of finding "experts" in a particular field, there should be a screening process so that the SC team will get people who know what they are there for and what they are expected to do, not just people who are "warm" bodies.

Compliance with mil specs not adequate.

Emphasis should always be placed on detailed advanced planning so that when the team comes in there are not on a fishing trip. They know exactly what documents to obtain from whom, what type of analysis to perform on them, for

what purpose. The moment the SC team gets in the door, it's a game of "Beat the Clock" to come up with results before the end of SC time. This is merely a general observation about SC studies and not a criticism of any single study effort.

Adequate manpower, manpower dedication, and time are all very important for planning and the ability to follow the plans throughout the SC.

The planning of the particular assignment that was performed by my sub-team was excellent. All team members' tasks were well defined.

Would suggest a more comprehensive meeting with all team members before and after the advance team visit.

My area involved finance--would have helped to have information on the financial structure/procedures prior to the visit. Also, the ACO reports from negotiations for indirect rates and accounting system reviews.

Coordination between the Should Cost activity, DCAS, and DCAA is essential with DCAS and DCAA personnel knowledgable of the contractor being assigned directly to the Should Cost team--not acting as separate reviewing authorities.

I was on two SC teams in 1983. One with Army, and one with AF. I am a DCASR (DLA) person with no experience on either program but 25 years experience working inside contractor facilities as opposed to Govt buying office. I feel I could contribute much more than permitted or asked on either program. Persons responsible for negotiation had a tendency to keep work to themselves rather than delegate to outside help. I was not invited to several meetings with contractor personnel, with whom I have had several years contact. I believed I could have been of assistance in discussion of company policy.

Again, going "off-site" for the planning portion is considered desirable.

I personally feel, as stated previously, that the team chief should be technical and not contracting. I also feel that it is a total waste of time to do a Should Cost study on a contractor still in development. He should have as a minimum, one year of production behind him before you do a Should Cost.

Possibly more interaction with experienced personnel in the SPO to get up to speed.

Should Cost findings may be enhanced if on site government agencies would provide a brief guide line on (1) contractors standards--scrap cost--acceptable deviation/variations (MRB actions) for parts. Also it's my opinion an AFIT course be developed for team members to attend prior to launching into inquiry.

The ability to ultimately reject the contractor's proposal.

Return travel authorization to home at two week intervals. Something like 10 days out, 4 days home, 10 days out. . .

The Should Cost team I last participated on was well planned and executed. The planning phase was adequate.

Noneffective Nonsupervisor
Questions 4-37

4. I had adequate knowledge of the contractor's proposal in drawing up my plans.

Informed of trip only one week before leaving for Should Cost.

Did not have knowledge of proposal until I arrived at contractor facility.

I knew little of the contractor or proposal until I arrived at the contractor's facility to start should cost.

5. The contractor was adequately prepared for our Should Cost (SC) visit.

If prepared it was to obstruct and delay. Invariably two to three or more days were lost in getting complete answers to simple and direct questions.

They knew we were coming.

To the extent possible. There were items we requested which the contractor may not have anticipated.

6. Detailed plans were a necessity for an effective SC.

Depends on the area and information available.

Yes, but. . . there should be plenty of flexibility to respond/react to responses to SC findings or to pursue suspected problem areas.

Pre-planning had to be modified several times during the course of the should cost due the type and availability of data presented.

7. We followed the plans we developed.

8. The SC plans had enough flexibility to allow for changes and problems.

Some areas required a change in plans.

There were problems but it appeared that the mission was accomplished.

The strict definition and limited scope to a near term lot

buy restricted flexibility. Contractor insisted on restriction.

One subteam chief seemed more in complying with the plan than following up leads.

9. The Should Cost planning process proved essential for a successful on-site visit.

Much protocol and grudging compliance if not outright hostility.

In some ways it seemed restrictive.

Was the SC successful? I received no feedback.

10. I had knowledge of the contractor's facility, operations, and on-going activities to help me in planning.

I saw neither contractors' facility prior to being on-site.

Not until I arrived at contractor's facility.

I work in the plant at the rep office--other members of the team took several days to get up to speed.

11. Good coordination and lines of communication existed with the government team during planning.

12. The use of civilian consultants would be a valuable addition to the SC planning effort.

(Comment by consultant), broader background, more flexible; varied industry exposure.

Other than the supplementing of manpower requirements it was not apparent that the consultants were an unusually valuable addition. It would be interesting to know if the work they accomplished warranted their cost!

Contractor rightfully had misgivings about releasing sensitive information to any one in group because of consultants.

They carried part of the load but their contribution, in my opinion, was questionable.

They did support manufacturing.

13. An advance team visit is necessary to enhance SC planning.

Should help resolve communication problems.

Consult with local (on-site) Government representatives.

Could save some time for the full group.

14. Team composition was adequate to conduct the SC planning effort.

I was well satisfied with our team composition and pleased with the AFPRO support.

15. The contractor was familiar with our purpose and provided adequate support.

Contractor was familiar with our purpose; adequate support is subjective.

Not willingly. I think they treated it as a purely showcase exercise in paperwork which would neither affect the specific lot buy nor their competitive position in the AFE source selection. They were wrong.

Begrudging support.

Well prepared the point where personnel in the second division we reviewed had been briefed well on the review of the first.

16. The SC team did not meet often enough to ensure proper planning and coordination.

Too many damn meetings.

I had no problems getting guidance.

It was handled very effectively.

17. Subteam planning efforts were useful in developing the individual plans.

I agree; however, I was concerned about emphasis in the wrong area.

18. A good relationship existed between the government and the contractor.

At the working level the relationship was good but it changed by the time responses went through the management screening process.

Yes, but each had different interests to protect, resulting in a healthy skeptical relationship.

In engineering, we had a good relationship.

19. Individual team members had adequate knowledge and skills to accomplish the task.

Some did! Some did not!

Quite a bit of time was spent defining our tasks and what was to be done with results.

In the manufacturing area, the govt didn't have enough truly qualified individuals in this area.

I wish I had been better prepared.

20. Previous SC experience is essential to a successful SC effort.

For team leaders and selected subteam chiefs.

Either the Team Chief or Deputy Team Chief along with a mix of the Subteam leaders should have previous SC experience.

Experience with contractor accounting system essential.

Helpful but not essential.

Having participated in two SCs--the second was somewhat easier than the first. What helped more than anything was an extensive industry background.

Absolutely!

Only for top leadership.

It certainly helps.

21. The team chief should be a colonel/GS-15 or higher.

The contractor should believe that the should cost visit is to be taken seriously, and the team should have as much clout as possible.

Grade is not as important as knowledge of the accounting system and a clearly defined purpose.

Rank tends to impress rank. I doubt if they would show much

respect or cooperation if the chief were a brown bar.

If nothing else, it makes a statement about the importance of the effort. It also tends to make both sides a little more responsive.

I believe the rank is irrelevant. If the company is cooperating (or willing to cooperate) there is no need for this type of horsepower.

Only so that the contractor takes it seriously.

22. The master schedule was clearly designed and available to all team members early in the planning.

Never saw one on either Should Cost.

23. The master schedule was useful in helping prepare detailed plans.

24. AFP 70-5, Should Cost, provided valuable guidance for SC planning.

It is so general to be of little use for the day-to-day work of a SC.

25. The organizational structure allowed for effective and efficient accomplishment of the planning.

26. My specific task was adequately defined.

Had no prior preparation until first organizational meeting on-site.

Sure--I defined it myself.

I was new to SC and felt as if the subteam chiefs should have provided more guidance. For example, I repeatedly asked for guidance for a final report and received none.

27. I received adequate management guidance in conducting my planning efforts.

28. Logistics support considerations for the facility visit were adequately addressed during planning.

Lodging facilities within short walking distance, adequate transportation for necessary travel, and reasonable sharing for recreational use.

29. I was able to dedicate my full time to the SC planning.

Spent some time on an unrelated problem at request of home office.

Only after I got to the contractor's facility.

30. The planning documents I prepared proved effective during the on-site visit.

Contractor had great difficulty understanding carefully prepared questions. Many requesting detailed explanations were first answered with a simple "yes" or "no."

31. I was given full responsibility and authority to accomplish my task.

32. It is necessary for the entire SC team to be brought together for an orientation seminar prior to the facility visit.

I think it would be beneficial but not necessary.

If not a seminar at least some prior orientation on purposes, procedures, authority, etc.

This might eliminate the "usual" wasted first week of orientation briefings, tours, etc.

This is essential if the team is not to waste several days learning the company structure, accounting system, etc.

It is not necessary, but it would help to eliminate problems at the facility.

33. I was given sufficient time to develop my plans.

Planning prior to the actual activity were nil. As for on-going day to day plans, sufficient time was available.

34. There were controls to monitor the progress and accomplishment of plans.

Daily progress reports. Mostly informal but adequate.

I was so busy gathering and analyzing data to allow time for monitoring plans.

These were established as the SC accomplished a direction and objective.

35. I was provided sufficient feedback on my plans.

36. Feedback was useful in improving my plans.

37. A common data bank of SC information should be made available for planning efforts.

This would only be useful for a later Should Cost at the same contractor.

Noneffective Nonsupervisors
Questions 48 and 49

48. What sources of information were helpful in SC planning?

Contractor proposal. Results of previous buys.

The contractor's proposal background, previous purchase history and history regarding the requirement for the should cost effort.

The advance team should brief AFPRO as to what info it seeks.

Past experience in industry is the best.

Very little information was provided prior to actual SC initiation.

None.

49. Do any areas of Should Cost planning need improvement?

Team members should have prior experience in should cost activities.

I feel very strongly that each SC should include some number of new people as trainees who might be expected to do another in the future. Orientation on the goals of should cost, audit/inspection techniques, etc. would be useful.

I also feel strongly that the team should consist of a large core of members with should cost experience.

It would be useful for the next time around to get some feedback on the results of just completed should costs. For example, I'd like to know what we did right, what we did wrong, how we could improve next time, and what the final contract outcome was.

Certainly all team members should have as much prior notice as possible of their selection for participation. Qualification of participants to contribute in required areas should be known to the team chief. Importance of the task should be emphasized and participation should be by prior voluntary agreement. I was pulled out of a previously assigned source selection activity for which areas of expertise were defined to participate unexpectedly in the SC.

I had then and have now no knowledge as to whether my efforts accomplished anything useful to the Air Force. I like to earn my pay.

The team chiefs and if possible the members themselves must be familiar with product line, the company structure, and functional organization activity prior to actual start. This wastes too much invaluable time just getting up to speed.

SC participants should be issued unescorted badges. If this is not possible the contractor should be required to supply a full time "taxi" squad to escort SC personnel. This escorted badge policy was used by one contractor as a stall tactic. This effectively kept us penned up.

I sincerely feel an admin and/or procurement type person is a vital necessity for a SC team. There are many menial jobs that are necessary to accomplish in order to give actual team members time to specifically work on SC efforts. I was kept busy all of the time. I was a procurement assistant and team members said I was very helpful.

The team chiefs should have had better advance planning regarding the roles of their individual team members. Team members were often unsure of what was required of them.

Programs should be more carefully chosen for should cost reviews emphasizing new products with no prior should cost reviews.

People to be contacted at facility and their cooperation.

Clearer definition of task areas.

Advance Team
Questions 38-44

38. I had adequate knowledge of the contractor's proposal in preparing for the advance team visit.

39. I had adequate knowledge of the contractor's facility, operations, and on-going activities to help me prepare for the advance team visit.

40. The advance team's size was adequate to conduct the advance team visit.

More than enough.

Sub-team chiefs and team chief should be extent of advance team make-up.

Advance team should be only key players.

41. Individual advance team members had adequate knowledge and skills to accomplish the advance visit.

Their selection should be based upon this prerequisite.

42. I received enough information from other Government agencies and the contractor to prepare for the advance visit.

Very little.

Had Army input.

43. The advance visit was useful in determining specific areas that needed detailed analysis.

I didn't find any!

Did not go to that detail in advance meeting--mostly just planning facilities, etc.

44. The advance visit was useful for determining the team members required to conduct the overall SC.

It helped a little.

I thought the team members had been selected by them.

I knew before hand what skills and people were needed.

The people doing the advanced planning must be knowledgeable of the contractor or facilities. If not he must make an additional earlier trip. Major areas of the review should established prior to the advance team visit.

Team Chief
Questions 45-47

45. I had adequate authority in selecting personnel.

No! I was given people.

I knew who I needed and team leader had authority to get them.

46. I was able to get the people I needed on the SC team.

No!

By and large.

Needed but in all cases not "wanted".

Certain people were not available.

I still believe I got the best people available.

47. I was given sufficient guidance and was provided clear lines of authority in the charter.

Not really!

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Should Cost is a technique of contract pricing that is used to develop a realistic price negotiation objective. The Air Force accomplishes the Should Cost by sending an integrated team of government procurement personnel, contract administrators, auditors, and engineers to the contractor's facility. The objective of the team is to identify uneconomical and inefficient practices of the contractor and to quantify the findings in terms of their impact on cost. Leading procurement analysts at Headquarters Air Force Systems Command and Aeronautical Systems Division identified the lack of proper planning guidance as a major problem facing Air Force Should Cost efforts. Therefore, the research focused on identifying the critical success factors of Should Cost planning. To establish the critical success factors, the researchers designed and distributed a survey that gathered data on former Should Cost team members' perceptions of various aspects of Should Cost planning. Comments were also solicited from the survey respondents through open-ended questions. The returned surveys were analyzed using the FREQUENCIES, T-TEST, and DISCRIMINANT subprograms of the Statistical Package for the Social Sciences. Based on the statistical analyses and the respondents' comments, the researchers identified twelve critical success factors of Should Cost planning.

Thesis